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IN THIS ISSUE

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SERVICING CHEVROLET HYDRAULICS

For the first time ever published—the detailed instructions for adjusting the new 1936 Chevrolet brakes. No Maintenance man can afford to pass this up.

BUILDING A SERVICE VOLUME OF \$100,000—

from an original investment of \$160, may sound like a fairy tale, but it's a true story. What's more—you can apply these same methods in your shop.

HOW TO BUILD A MIDGET RACER

Here is the article that the race-fanmechanic has been waiting for. It gives detailed instructions and dimensional illustrations on these popular small jobs.

MAINTENANCE MAN'S PRIZE CONTEST

DECEMBER

1935

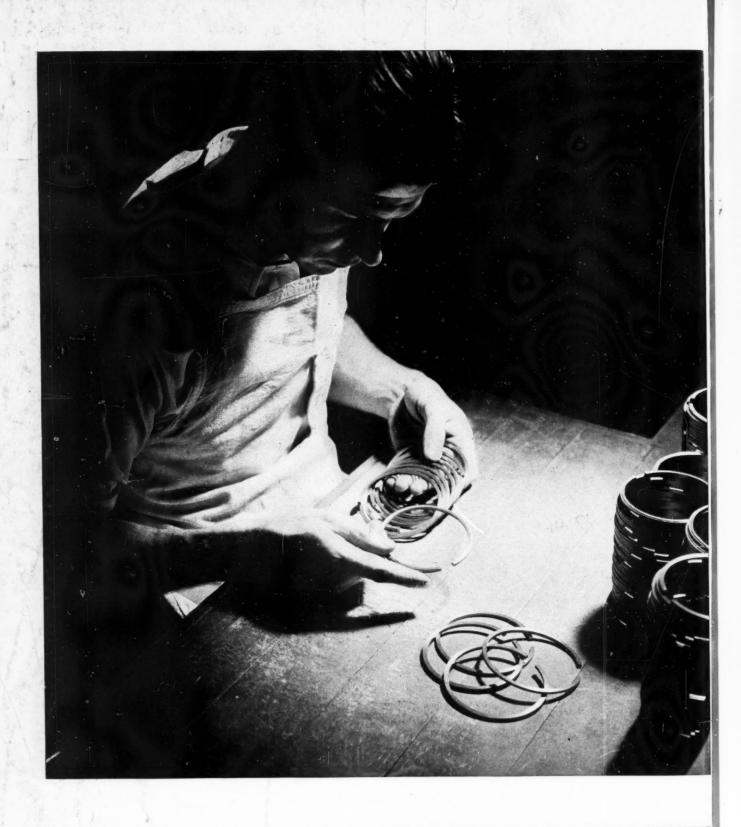
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Published Monthly

Vol. XLI, No. 1

December, 1935

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Owned and Published by



CHILTON COMPANY

(Incorporated)

Executive Offices

Chestnut and 56th Streets, Philadelphia, U. S. A.

C. A. MUSSELMAN, President
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WORLD'S LARGEST



The MONITOR NOTCH IN SEALED POWER STA-TITE PISTON RINGS controls the ring joint so that gap end flutter is eliminated and leakage of power past the joint is stopped.

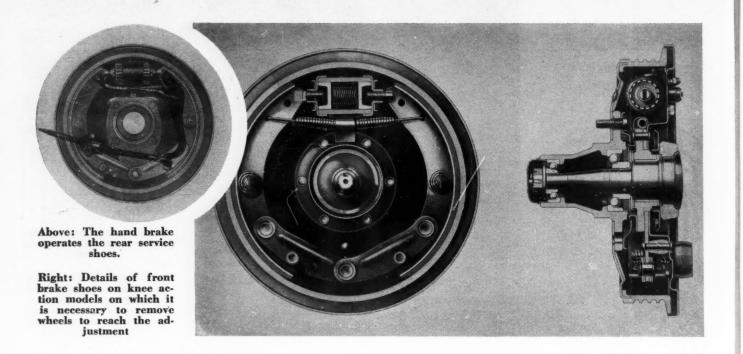
BUT, IN ADDITION, the Sealed Power MONITOR NOTCH makes possible another important feature. A SEALED POWER STA-TITE RING DOES NOT CREEP IN THE PISTON GROOVE because - - first, the ring cannot slip from its original position on the inner spring because of the MONITOR NOTCH and second, the inner spring cannot creep from its original position in the piston groove because it, too, is anchored by frictional contact against the back of the piston groove (see illustration above).

Sealed Power Sta-Tite Rings take the shape of the cylinders to which they are fitted and they stay there.

The World Pides on Sealed Power Power Power Power Power Power Power Power Stated Power States Power States Power States Power States Power States Power Power Parts



December, 1935



Servicing

1936 Chevrolet Brakes

A Simplified Study of the New Hydraulics, with Complete Instructions for Adjustments

By Bill Toboldt

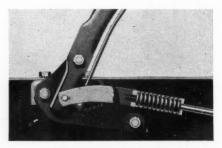
THE 1936 model Chevrolet cars, with new type hydraulic brakes, are already on the road, making it necessary for service men, everywhere, to know the details of adjusting and bleeding these brakes. Instructions are simple and no drum to lining clearance is specified, the adjustment consisting essentially of tightening the brakes until a drag is felt and then backing off four notches, or clicks.

On the knee action models, it is necessary to remove the front wheels to get at the adjustment ports in the brake drum. On models with conventional front axles and on the rear wheels of all models, the adjusting ports are in the brake backing plates, making it unnecessary to remove the wheels when making any clearance adjustments. The reason the adjusting hole covers are placed in the brake drums, on the knee action models, is that the knee action unit would make it difficult to reach any adjustment through the backing plate.

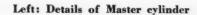
Before adjusting brake lining to drum clearance, make sure that there is sufficient pedal clearance at the toe-board. While this seldom requires adjustment, it should always be checked and, if insufficient, loosen check nut on master cylinder push rod and turn shaft so as to secure ¼ in. clearance between brake pedal and the toeboard. Then tighten lock nut.

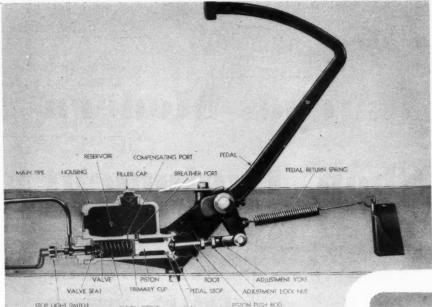
After adjusting pedal clearance, disconnect the emergency brake by removing clevis pin from junction of emergency brake pull rods and cable. Then jack up all four wheels and remove adjustment hole covers from brake backing plate. In the case of the knee action cars, it is necessary to remove the front wheels and then remove the port covers from the brake drums.

Insert a screw driver in adjusting hole so as to engage the teeth



Hand brake mechanism





Below: Method of making shoe adjustment and details of wheel cylinder

of the adjusting wheel, as shown in one of the illustrations, and turn the wheel clockwise as viewed from the end of the cylinder, until the brake begins to drag. Then turn adjusting wheel back four notches, which gives the proper lining to drum clearance. Replace the adjusting port covers. The same procedure is followed at each wheel.

Each time the hydraulic brakes are adjusted it is necessary to adjust the emergency brake which mechanically operates the service brake shoes on the rear wheels. The procedure is as follows:

Set the hand brake in the released position and then pull on the cable until all slack is removed. Turn adjusting clevis on rod until the holes in the clevis line up with the hole in the cable. Then install clevis and cotter pin. Hold clevis and tighten lock nut.

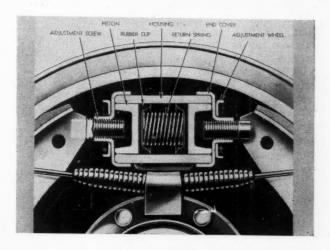
The adjustment of the hand brake should be checked so as to be sure that the brakes on the rear wheels are applied equally. If one brake is tight, slack off on the adjustment rather than tighten the adjustment on the loose brake. This must be done at the junction of the brake cable and pull rod. Do not attempt to touch the wheel cylinder adjustment when adjusting the hand brake.

Bleeding these brakes to remove any air follows conventional practice. That is, the bleeding must be done at all wheels whenever a line has been disconnected or when a leak allows air to get into the system. During the bleeding operation, the master cylinder reservoir must be kept at least half full, and this is most easily accomplished by a special master cylinder filler, which automatically maintains the correct level during the bleeding operation.

Carefully clean all dirt from around master cylinder filler plug, remove plug and install the automatic filler. Open automatic master cylinder filler valve. Remove bleeder valve screw. Attach bleeder drain hose, keeping the end of the drain below the level of the fluid in the drain

jar. Unscrew bleeder valve onehalf to three-quarters turn.

Depress brake pedal by hand, permitting it to return slowly. This forces the fluid through the lines and out at the drain, carrying with it any air that may be in the system. When air bubbles cease to come out of the drain hose, the bleeder valve is closed and the hose removed. The same procedure is followed at the other three wheels.



After completing the bleeding operation, the master cylinder should be filled and the filler plug replaced.

Whenever the brake drums are removed, care must be exercised on replacement that the drain hole in the drum lines up with a similar hole in the axle shaft flange.

After replacing drums, depress pedal firmly to line up articulating links before adjusting shoes.

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Where Shop Appearance

Matches Modern Shop Equipment

A PIECE of shop equipment doesn't mean a heluva lot to the average service customer—but you can make it an impressive and irresistible selling force.

U. S. Battery & Electrical Co. of Memphis, Tenn., an outfit that was once "just another battery station," did it.

The appearance of the shop was improved... Equipment was modernized... Mechanics were enlisted in a cooperative effort to keep the shop clean... Customers were convinced... And profits increased.

All of this was the result of grouping their equipment; setting up a Motor Tune-Up Department where every piece of equipment "stood out"; and investing a few extra dollars in paint, wall board, awnings and neon lights.

The plan got results—the kind that count. For instance, labor sales in the service department increased 50 per cent.

Fred Bauer, Jr., who is sales manager of U. S. Battery & Electrical Co., tells how, step by step this independent repair shop added modern shop equipment. They figured they had a pretty good setup, having bought good, reliable stuff, such as a motor analyzer, oscillograph, mercury vacuum meter, battery discharge test stand, headlamp tester and magneto winding tester. BUT—

Here's an important point. Mr. Bauer discovered that modern equipment, set up in the ordinary background of his shop didn't click as it should. "The interior of our building was just average," he pointed out, "and its background was such that the actual beauty and attractiveness of the equipment was wasted."

So U. S. Battery & Electrical Co. invested a little money in SHOW-MANSHIP. Mr. Bauer's first step was to get an architect to design beauty and utility for a service

The Service Station That "Puts On the Top Hat" GOES PLACES, Memphis Maintenance Man Finds

By Frank P. Tighe

station interior. Then he got a good carpenter, a man who could follow the architect's blue prints. From there on the plan became very simple.

Here are the details of construction and color scheme at U. S. Battery & Electrical Co. A good quality wall board was applied to the rough finished concrete wall and painted as follows:

The top panel was painted light yellow with an orange border. The letters "motor TUNE-UP department" were cut out of 1-in. wood and nailed to two silver painted wooden strips.

On the lower panels the columns are black and orange and these are continued along the floor as floor divisions. The floor is painted a blue-gray.

The shop has 7500 sq. ft. of floor space, uninterrupted by posts or obstructions of any kind.



Before.

An additional space of about half that size is occupied by the parts department and electrical motor repair department.

The "before" and "after" pictures shown

herein tell the story of the effectiveness of this change over the U. S. Battery & Electrical shop.

Aside from a satisfying increase in business, there were other important results which Fred Bauer, Jr., sums up in five short, factful para-

graphs:

"1. We were at one time 'just a battery station.' It was hard to convince our old regular customers that we performed other services. The job is done now because they can't help but see it every time they drive in

"2. We have something new and different to talk about in our advertising.

"3. The appearance of our tune-up department gets folks talking to and sending their friends in for service.

"4. Almost every customer has a favorable comment to make in regard to the appearance of our shop. Some



A glimpse at the U. S. Battery & Electrical Co. exterior . . . an up-to-date service station earning "up-to-date profits"

of our friends become facetious with inquiries as to when the lace curtains will be hung and if it is necessary to remove the shoes before stepping on the floor. But they like it and we know they like it!

"5. Porters cost money, but only half the clean-up help is required when mechanics cooperate in an effort to KEEP THE SHOP CLEAN. Dressing up a service station gives the mechanic a pride in his workshop and prompts him to exercise care in keeping the department clean as he goes along."

Behind the whole plan at U. S. Battery & Electrical Co. is one

basic idea, as Mr. Bauer expressed it, "The proper arrangement of the tune-up department will bring 'em in the first time BUT they don't like to pay their good money for a look, no

matter how much paint you use. "In order that the whole plan will be effective, the customer must receive a good job; better performance in his car; better mileage; and greater economy. In short, whatever was wrong with his automobile when he was attracted to our place of business must be corrected 100 per cent. To do this you must employ the best of motor and electrical men; use proper equipment and tools; offer convenient working conditions; have a good supply of quality parts; and maintain accurate factory service information."

To put your best foot forward in selling service here's what U. S. Battery & Electrical Co. believes in doing: "Dress up your shop to match the equipment you have."



Maintenance Men Must Know-

How To Line-up Doors and DOLLARS

Correct Alignment Eliminates Body Squeaks and Customer Howls

THE correct alignment of doors is a big factor in eliminating squeaks and rattles, and if a service station wants to keep on the right side of its customers it needs to know how to do this job quickly and well. In this connection, the Fisher Body Service News recently carried instructions covering the procedure to be followed when aligning doors on the 1935 and 1936 Fisher Turret Top bodies as used on the General Motors cars.

Two general methods of obtaining correct door alignment are used. Correction method No. 1, in which a spacer is placed between the hinge and the door pillar, the spacer being placed close to the inner edge of the hinge, that is, as far from the hinge pin as possible. In correction method No. 2, the spacer is also placed between the hinge pillar and the door pillar, but as close to the hinge pin as possible. These two correction methods are illustrated and the first method serves to decrease the spacing at the hinge side of the door and increase the spacing on the lock side of the door. The second correction method will increase the spacing at the hinge side of the door and decrease it at the lock side of the door.

These spacers can be made of hard cardboard or from sheet lead, which can be hammered to any desired thickness, and should be $\frac{3}{8}$ in. wide and as long as the hinge is wide.

Before attempting to align a door, the mechanic should first check the vertical spacing at the hinge side of the rear door. This is done by first removing the door wedge plate and the door side rubber bumpers. Also make sure that all of the hinge screws are tight. Then close the door and check the vertical spacing, which should be the same as shown in Fig. 3. If the spacing is unequal, add shims, or tighten body bolts as required and as indicated under the various illustrations. Always align the rear doors first.

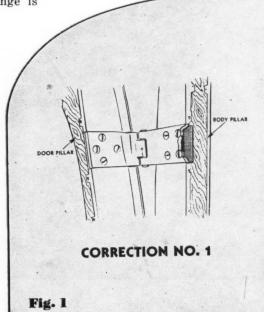
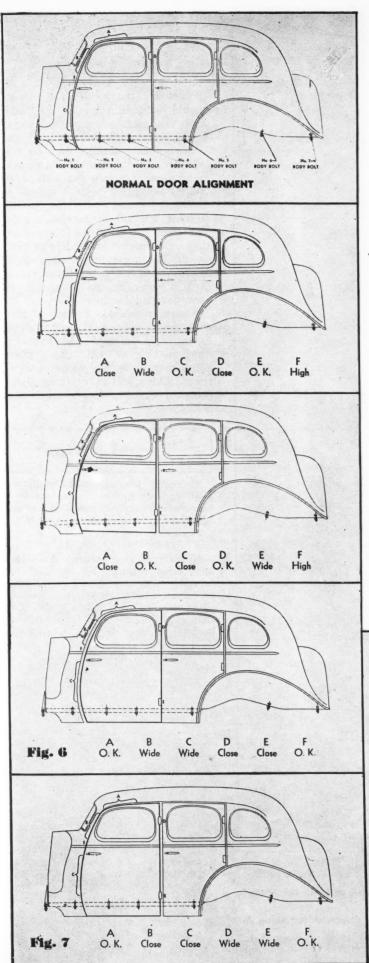


Fig. 3

Fig. 4

Fig. 5



If, after adding shims at the hinges, it is found that the rear door is too low at the belt molding, the door may be raised by adding additional shims at the body bolt (No. 5) nearest the hinge pillar.

If the rear door is too high at the belt molding and too close at the roof, the door may be lowered by removing a shim at No. 5 body bolt or by adding a shim at body bolt No. 4 to raise the center pillar, which will serve the same purpose.

When the rear door has been properly aligned, install the door wedge plate and bumpers, after which the front door is lined up in the same manner.

(Continued on page 24)

Fig. 1. Correction method No. 1. Note that the spacer is installed on the inside of the body pillar, that is as far from the hinge pin as possible. This will draw the door closer to the hinge pillar.

Fig. 2. Correction method No. 2. Spacer is installed as close to the hinge pin as possible. This will move the door toward the body lock pillar.

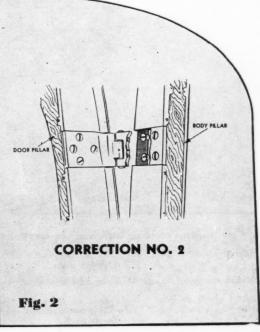
Fig. 3. Normal door alignment. Note that door spacing is equal on all sides.

Fig. 4. Use correction method No. 2 at D.

Fig. 5. Use correction method No. 1 at E.

Fig. 6. Use correction method No. 2 at E and D.

Fig. 7. Use correction method No. 1 at E and D.



GE

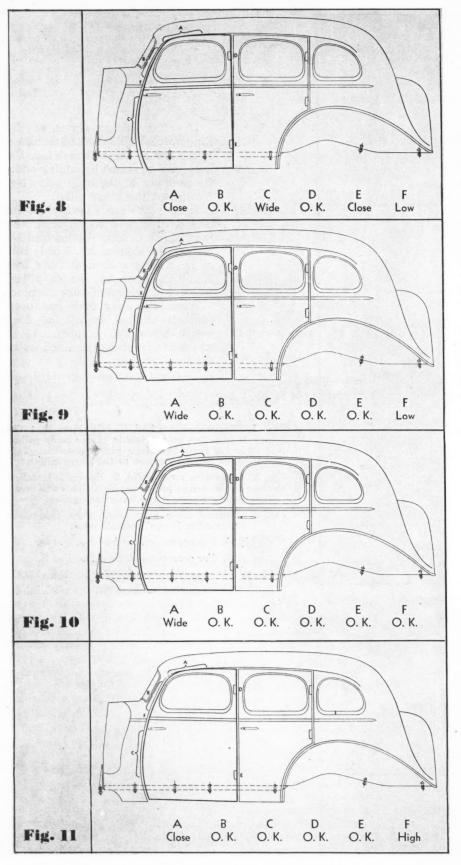


Fig. 8. Calk up drip molding at A and use correction method No. 2 at E.
Fig. 9. Add a shim at body bolt No. 5 for rear door and at body bolt No. 4 for front door.

Fig. 10. Build on door flange at A, or add solder at roof drip molding along A.
Fig. 11. Add shim at No. 4 body bolt or take out shim at No. 5 body bolt.
Add shim at No. 1 and No. 2 body bolts or take out shim at No. 4 body bolt for front door.

Various parts of the doors should be regularly lubricated, and while the procedure may vary somewhat with different bodies, the following instructions may be followed if car manufacturer's recommendations are not available. On door locks place a few drops of machine oil and work the handle so that the oil is carried inside. The same procedure is followed on the door safety lock. Hinge pins should be lubricated with a light machine oil. A pencil type lubricant is generally recommended for door dovetail bumpers.

Should a squeak develop at the door check, make sure that the rod is properly aligned and apply a light coating of soft soap. Then open and close the door several times, which will carry the soap to the rubber guide on which the rod slides.

Tune Up Tips

To reduce the possibility of blown cylinder head gaskets, some car factories are now recommending the use of special gasket cements or seals on the cylinder head gaskets.

New type water pump bushings have been released by Pontiac for service. The new bushings will be serviced for 1933, 1934, 1935 and 1936 eight-cylinder cars and the 1935 and 1936 six-cylinder cars. The new rear bushing can also be used on the 1932 six. Light machine oil should be used to lubricate the water pump bushings.

Pontiac has made available a special cylinder head gasket 1 2/3 the thickness of the standard gaskets. This has the effect of reducing the compression ratio from 6.2 to 5.7 and overcomes the difficulty of pinging, experienced in some localities near sea level or where fuel of low octane rating was used.

A newly designed oil distributor valve, part No. 837957, went into production on the 1935 Chevrolet after engine No. 5153591, and is available from General Motors Parts Corporation warehouses.

The new valve can easily be distinguished from the old valve in that the new valve shank is about one-half the diameter of valve, part No. 837639, used during early production. The spring on the new valve is also smaller than that of the early design.

Repairman's Letter to Santa Claus

bleav Santa Claus, —

It ain't nice of me

to wish for something that

most folks don't like —

fut cold weather's got to

come, so leto have it!

Winter weather helps my

fusiness. When the thermometer

takes a nose-dire and my

customers try an' start their

cars—and can't—they come

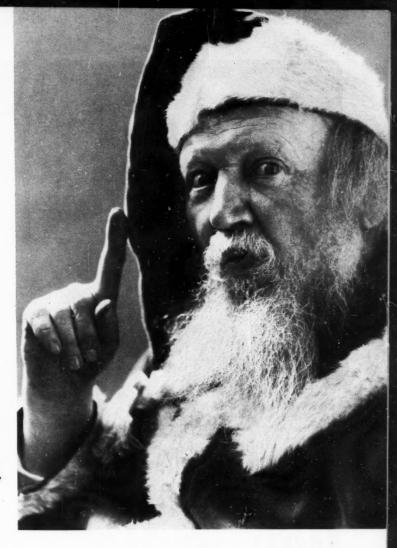
to me, 'ato what.

Kriving in cold weather

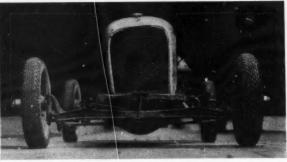
is pretty tough—fut people

still drive—and radiators Treese

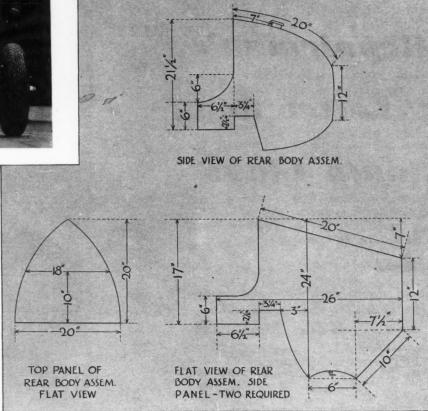




"Thank god, I know where I can get a good mechanic." you know, Santa old boy, people drive through snow storms and over icy roads and through slush and sleet, - well & want to help them fight their way. So I sell em now-skid Chains, anti-freeze, car heaters, winter fronts and defrosters - and a lot of engine tune-ups too. hard luck, but my jot is to from out twisted fenders and dented bodies, to replace broken axles, springs and steering sears -Do send me some of that rare old-fashioned winter weather and Ill be much obliged. Jim Mc Cannic



(Above) Front view, showing front axle welded after having approximately 12 in. cut out of center.



(Right) Dimensional drawings of rear body assembly panels when cut from flat stock, before forming.

How to Make a Midget Racer

Using Stock Parts, Here Are Detailed Instructions on Building a Midget Chassis With a 72 in. Wheelbase

By Robert Hankinson

THERE'S a lot of glamour and excitement in midget car racing, and one of the things that has helped to make this sport popular is the ease with which these jobs can be built. Of course, it is possible to pour a lot of jack into one of these crates, but a midget that can give a good account of itself can be built for about \$300. Naturally, a lot depends on the man who is doing the job and the parts he selects.

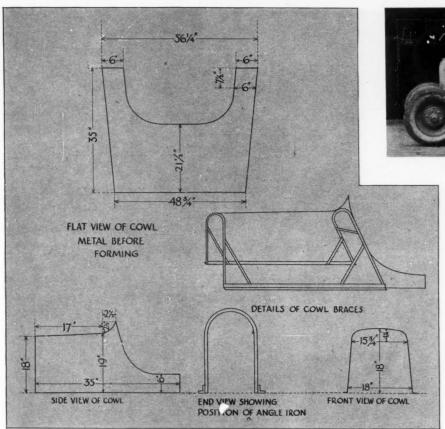
Details and dimensions will vary

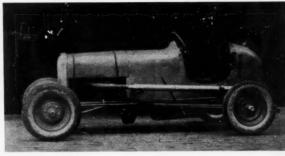
a lot with the engine used. For instance, if a motorcycle engine with a chain drive to the rear axle is used, the overall height of the car will be a great deal less than for a conventional engine with shaft drive to the rear wheels.

Since Ford Model T parts are readily available and low in price, many builders of midget cars have used these in building their cars. These parts were also used wherever possible in the midget described and illustrated in this article. This particular chassis and body were designed originally for use with a Saxon engine. However, any other small engine can be substituted.

This job has a wheelbase of 72 in., a 46-in. tread in front and a 44-in. tread at the rear. Special 4-ply tires 4.00 x 12 in. were used. Wheels are also special and purchased for midget work.

FRAME—Built of the regular $\frac{1}{8}$ -in. channel iron with a $\frac{1}{2}$ -in. flange and a depth of 3 in. tapering to 2 in. at the front. The front cross member is made of the same stock, and is electrically welded to the side rails with the 3-in. surface on top so as to give a flat surface for mounting a front spring retaining bracket. The rear cross member is the regular Model T Ford rear cross member, but instead of being welded directly to the frame side rails it is welded to inverted "U" brackets which are welded to the rear of each side rail. The center cross member is made of flat





(Above) Side view of finished car, showing hand brake and exhaust pipe mounting.

(Left) Dimensional drawing of cowl panel before forming, and design of cowl framework,

In Your Own Repair Shop

stock. Its design and location depend on the type of engine and steering mounting used.

SPRINGS — Of the transverse type, made from Model T Ford springs, and mounted to the axles by the regular Model T spring perch. The front spring is of three leaves, $1\frac{1}{2}$ in. wide and $21\frac{1}{2}$ in. from eye to eye. The rear spring is of four leaves and is 2 in. wide. The front spring is mounted to the frame at a plate which is bolted and welded to the center of the front cross member, extending forward 3 in. Four bolts with retaining plates and nuts hold the spring to the underside of this plate. The rear spring is mounted inside the channel of the rear cross member.

AXLES—Both front and rear axles are cut down from Model T Ford axles. In the case of the front axle, the cut is taken from the center, and the finished job leaves an axle I beam that is 40 in. between centers of king bolts. In

(Continued on page 70)



Here's How-

2 Unemployed Servicemen

\$160. Original Capital

1 Service Inspection Idea

3 Years of Hard Work

= \$100,000 Service Business

By J. K. Novins

Three years ago two young mechanics, with more ideas than capital, established a small service shop in downtown Los Angeles—in a highly competitive district. Without price advertising, without ballyhoo, Fred E. Hunziker and Ernest L. Benn built up a \$30,000 service volume, consisting mostly of heavy service—complete overhauls and other major operations.

Last year their firm, the Safety System Service Company, averaged \$15 to the jcb. During the same period this small shop, run by formerly unemployed service men, handled no less than 100 rebores. The two boys started out with a total capital of \$160 to pay a month's rent and for meagre equipment. But they had an idea, a service inspection system that brings in customers through the front door and writes up fat orders. The boys developed this system, have used it consistently for the past three years, and during that time it has brought in well near \$100,000 worth of service volume.

The owners of the Safety System Service Company offer free a complete mechanical inspection service. They average 12 check-ups a day. They have yet to miss a single sale



as the result of these systematic inspections. It is not unusual for a single inspection to result in a \$150 or \$250 service job. The smallest service job on record amounted to \$2. It has sold profitable service jobs to car owners that they had never seen—names picked from "canned" owner lists. The inspection system used in this shop has brought back old, forgetful customers and, more important still, it has helped to make the lubrication rack a feeder for shop service.

They designed an inspection form that is different from the forms used in most shops. It is an impressive-looking document, measuring 17 by $8\frac{1}{2}$ in., on which they not only analyze the condition of every operating unit of the car, but also note what work should be done and how much it would cost. The same form is used as a work-sheet for the shop, as a record for sales follow-up, and frequently as



Fred Hunziker and Ernest Benn who planned a Free Inspection Service, followed through completely, got the customers and made money.

a record for the customer to compare prices, if he so desires.

"We don't mind in the least if the customer takes a copy of the inspection report with him to compare with prices in other shops," explained Fred Hunziker. "Nine out of ten owners come back to give us the job. Why? Because they realize that we have done a thorough job of inspecting the car for defects and, like the proverbial family doctor, we are in the best position to cure them.

"A great deal depends on how the inspection is handled. No one in the shop is permitted to handle such an inspection except my partner and myself. This is to assure the customer of personal attention.

"In writing up the inspection report we always take into consideration the financial condition of the car owner. This is very important, from a selling standpoint, yet is frequently overlooked in many shops having free inspection service. A rigid inspection may show that the car needs \$100 or \$150 worth of work to put it in good running condition. But can the owner spend that much?

"We have found a ready solution to this particular problem. First of all, we make a thorough, an honest inspection, listing everything the car needs in labor and parts, with prices for same. We then go over the detailed report with the owner. If he is not in a position to have the full work done, we then check the absolutely essential operations to keep it in running condition. In practically all cases this can be done, except, of course, when the car is in such bad condition that it does not warrant reconditioning.

An interior view of the Safety System Service Co. shop, where they inspect 12 cars daily.

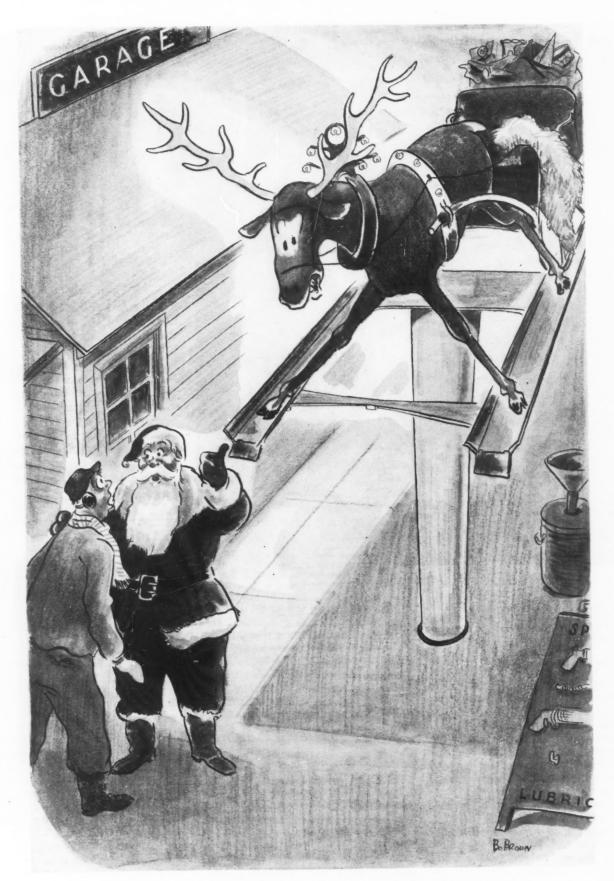
"When we make a partial repair it's a sort of pay-as-you-go proposition that appeals to many owners.

"Each inspection requires at least two hours' time to complete. First of all, we have organized the shop into a smooth-running organization, with a competent man in charge of each department, so as to require the least amount of supervision. Secondly, we designed the inspection report form to permit us

(Continued on page 97)

PRopert Ket	SOOD HILE FREE INSPECTION	PRIMERCAL 4718
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	Tylitan can	0

Here is the Inspection Sheet (actual size $17 \times 8\frac{1}{2}$ in.), which is a complete diagnosis of the car inspected.



"-and be sure you use winter lubricants"

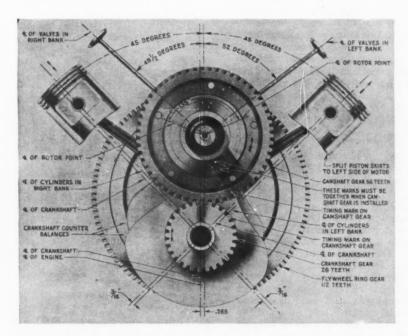
The Readers' Clearing House

Adjusting Ford Automatic Advance

Would you kindly send any information concerning the adjustment of a 1933 Ford V-8 distributor automatic advance?—C. E. Schanken, Jr., 1019 Haverhill Road, Baltimore, Md.

CORRECT adjustment of the vacuum brake on the ignition unit of the Ford V-8 is that with no vacuum to release the plunger the centrifugal force of the spark advance weights will overcome the drag of the brake and the cam will start to advance at of its travel. Turn ignition switch on. Move adjusting screw upward slowly, watching points of No. 1 spark plug. When spark occurs at spark plug points the spark timing is set at exactly top center. Then tighten the screw and be sure final adjustment was upward.

Note the position of the graduation on the adjusting screw plate with regard to the line on the distributor body. Working from this point, move the screw upward an additional graduation. Spark will then be set to occur at exactly four crankshaft degrees before top center.



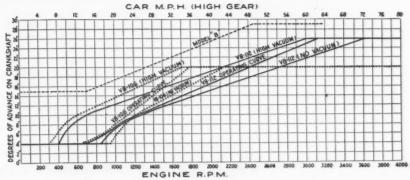


Bill Toboldt

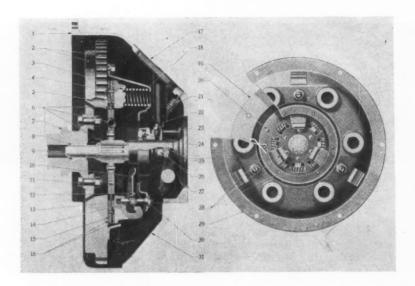
Editor of MOTOR AGE, will continue to conduct the Readers' Clearing House. For many years he has been in direct contact with automotive repairmen, service managers, and factory engineers. His vast experience with actual shop practice enables him to diagnose your difficulties and discuss them with you. Take advantage of the information he has at hand. When writing please use your business letterhead or attach a business card, to indicate your connection with the automotive trade. Name and address will be withheld from publication on request.

an engine speed of approximately 850 r.p.m.

Ordinarily, the spark can best be timed by noting the actual performance of the engine. In this way, the spark is timed for the fuel used and the condition of the engine at the time. However, when correctly set, the spark occurs at four crankshaft degrees before top center. Then, after adjusting the breaker points to .012 in., loosen the breaker plate adjusting screw, moving it to the bottom



E



CLUTCH THROW-OUT LINKAGE ADJUSTMENT

I will appreciate it very much if you will send me the correct information on how to adjust the linkage between the clutch pedal and the throwout fork shaft on a DL Dodge six and a CT Chrysler eight. J. Bordenave, 2751 Gladiolus St., Ner Orleans, La.

SERVICE instructions for both the Dodge DL and the Chrysler CT clutches are the same. First of all, the clutch pedal stop screw should be adjusted so as to locate the clutch pedal as high as possible without interference with the floorboard. The clutch relief fork lever adjusting screw should next be adjusted so as to give 1½ in. free travel of the clutch pedal measured at the pedal pad before any resistance can be felt. This free pedal travel must be maintained to insure proper clearance between the clutch relief bearing and clutch relief lever.

The clutch pedal stop screw has no connection with the free movement of the clutch pedal but is only provided to adjust for clearance at toeboard and to change the angle of the pedal. The clutch release fork lever adjusting screw controls the amount of free play of the pedal. It is therefore necessary to distinguish the difference between these two adjustments.

SQUIRT HOLES PLUGGED ON WORN ENGINES

Has the Clearing House ever answered any questions like this?

A car having forced feed lubrication to the main and connecting rod bearings was driven so far that the mileage had gotten around 50,000 and the engine consumed considerable oil. The car was then overhauled and new rings installed, but did not have the

cylinders ground, honed or bored out. Then after about a thousand miles it consumed as much oil as it did before the overhauling. This was about a quart to every 70 miles or so.

The connecting rods have holes in the top of the crank bearing to furnish oil from the cam shaft and parts. It was then recommended, as the car used so much oil, that these holes be plugged up and that enough oil would be then furnished from around the crank bearing to supply the cam shaft and other parts. This was for an engine that has considerable wear on it only. This procedure was claimed to help the oil consumption and still furnish oil enough for the other parts.

What I would like to know is if you have ever had this question arise and what the results were.

Would you recommend this operation to help save oil?

Do you think that the other operating parts would receive enough lubrication with this done?—A West Virginia Subscriber.

PLUGGING the squirt holes in the connecting rod bearings is a very common repair procedure on engines that have been driven 30,000 miles or better. The result is to improve oil economy. It is true that there will be no oil thrown onto the cylinder walls from the squirt holes but because of worn crankpins and bearings there will still be sufficient lubrication of the cylinder walls as the worn crankpins result in considerable oil throw-off.

Naturally, if the crankshaft is reconditioned and new bearings are installed, the squirt holes should be opened once more.

On a worn engine with the squirt holes plugged up, the cylinder walls receive sufficient lubrication and I would not hesitate to recommend the procedure on any engine that has been driven from 30,000 to 40,000 miles.

Chilton Flat Rate Manual Being Delivered!

Beating the announcement date of January 1, the new tenth edition Chilton Flat Rate came off the press several days ago. Copies have been sent to all who purchased in advance.

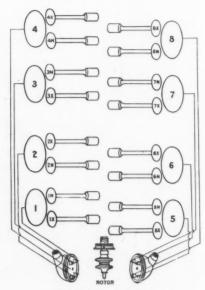
Our representatives are now able to deliver immediately the new edition to you. If you do not want to wait until our man in your section reaches you, order by mail, addressing Chilton Rook Dent. The price is \$6.00.

der by mail, addressing Chilton Book Dept. The price is \$6.00.

As Chilton originated the Flat Rate Manual and has brought it through ten editions to its present perfection of thoroughness and size, and as there are imitations of this great Manual, make sure that the Flat Rate you buy bears the name of Chilton on the cover.

Wants Firing Order; Flat Rate Correct

On page 407 of the Chilton Flat Rate Manual you give the Ford V-8 firing order as 1R, 1L, 4R, 4L, 2L, 3R, 3L, 2R. Are you sure this is right? —Otis D. Fritz, 2966 Briggs Avenue, New York City.



FIRING ORDER 1-5-4-8-6-3-7-2

THE firing order for the Ford V-8 as given on page 407 of the Chilton Flat Rate Manual is correct. The crankshaft, camshaft and the angle between the cylinder banks is such that when No. 1 cylinder in the right bank has just fired, No. 1 in the left bank is just coming up on the compression stroke. Then, when that cylinder has fired, No. 4 (right) is brought up on the compression stroke, and so on.

HAS SPARK KNOCK ON ACCELERATION

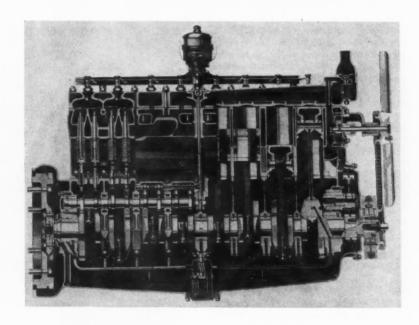
I have a 1935 Oldsmobile eight that pings when it is accelerated to pass another car or when climbing a hill. I have returded the spark one degree and this does not stop it. I will appreciate any information you can give me about this. Elroy Hensler, Hensler Garage, Henderson, Minn.

THIS car is equipped with a double set of distributor points and it is very important that these points be properly synchronized, otherwise a very definite spark knock will exist. We assume that you have checked this point as you mentioned that you have retarded the spark one degree without beneficial results. The quickest and best method we know for overcoming this condition is to install two cylinder head gaskets. Theoretically, this should result in a loss of power Theoretically, but practically the performance will be entirely satisfactory to the owner. After you have installed two gaskets you may find that you are able to advance the spark slightly without bringing in a spark knock but at the same time giving increased perform-

Another Request For Mis-Firing Chart

I would appreciate it very much if you could send me a chart on engine missing. The same as you are sending Meyers Service Station, 122 N. Broad St., West Hazleton, Pa. You mention sending this chart on page 50, August issue of Automobile Trade Journal. Ventura Automotive Co., 1309 Carondelet St., New Orleans, La.

I N accordance with your request, I am sending you a chart on engine missing and if there is any other information you desire, please be sure and call on me.



JOB OVERHAULED BUT KNOCKS CONTINUE

We would like to know what would cause this knock in the motor of a Packard 1929, six cylinder, that was rebored, has new pistons, pins and rings installed. It has a knock that sounds like a piston but, upon rechecking, the pistons have been found to be in perfect clearance and the pins also seem to be perfect.

Are there any theories that you know of that may cause this knock? Kindly advise us at once.—B. Peskoe, Norwood Tire Co., Inc., 191 New Brunswick Ave., Perth Amboy, N. J.

ON your 1929 Packard, the first thing I would check would be the alignment of the cylinder bores as it is entirely possible that when the cylinder bores were reconditioned that they were not bored at right angles to the crankshaft.

There is also the possibility that there is not sufficient metal removed to take out any ridges that were present. There is also a possibility that when this engine was reconditioned it was not thoroughly cleaned afterwards with the result that the pistons and walls were worn excessively. I would also advise checking the connecting rod alignment and the end play of the crankshaft and camshaft.

If this engine was fitted with strut type pistons, it would also be advisable to check the struts to make sure that these are tight.

Brake Squeaks Are His "Waterloo"

I am considered quite an authority on brakes myself but this is one time I have met my "waterloo" at least partly, if not in full.

On a surprising number of new Hudsons and Terraplanes released from the factory, we have found two most annoying squeaks—one a brake squeak, applying brake with car standing still, the other a brake squeak (not tire squeal) while driving car and applying brake at any speed.

The standing-still squeak is a "cinch," we overcome it every time by lubricating backing plates.

The other squeak is a "lulu" inasmuch as on some cars we lick it and with others, though using the same procedure, it becomes worse.

Outlined here are some of the operations we have employed to overcome the condition and at times have combined all of them in one operation on several cars.

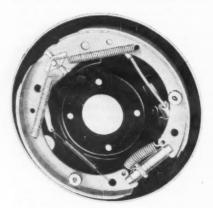
1—Lubricated backing plates. 2— Tapered lining as far back as 1½ in, from heel and toe of shoe. 3— Graphited all cables, 4—Peened rivets good and tight to make sure lining wasn't loose on shoe, 5—Gasoline sanded and dry sanded both shoes



and brake drums. 6-Blown out all dirt and dust with 150 lb. air pressure. 7-In extreme cases (have thin cut taken off drums to assure trueness). 8-In extreme cases (have drilled 3 3/16 in. holes width of shoe through shoe and lining at both heel and toe and filled holes flush with lining with lead and solder). (This has helped a lot-But, sometimes it doesn't). 9-Tightened spring shackles, U bolts and backing plates to axle housing. 10—Complete major adjustment as outlined in "Brakes." 11—Inflated tires to proper pressure. 12-Changed to different braking ratios on front and rear brakes. 13-Added leaves to front spring to stop car from nosing down in front. 14-Road tested car at all speeds and get perfect equalization. 15-Have even changed to other make lining. (In none of the lining changeovers has it helped.) 16-Have kept accurate check on all operations used on all cars and have used these operations "only" on cars that have been "corrected" on cars that have squeak and have never been worked on before, only to find they don't always work. 17-Kept a check on weather conditions.

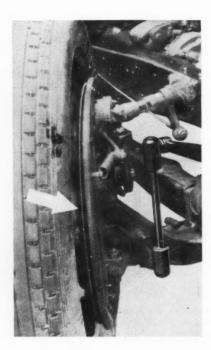
It seems that since I have been with this company that I have been the only person to ever correct any of these jobs. However, I'm not satisfied. I'm looking to you to pull some magic out of your sleeves and help me lick all of them.

Also on Terraplanes 1932, 1933, 1934 and 1935 after 10,000 miles of driving, I notice that with brakes adjusted and pedal jack applying brakes, wheels will be locked ahead and still turn perfectly free in reverse turning, (while car is jacked up). However, it doesn't affect braking action at all. These jobs have good brakes. On occasion I have tried re-centering shoes and going through major adjustments, only to find this gives an awfully hard pedal. It seems that



the linings wear thin on one end only of "both shoes."

If you can forward information on this along with brake squeak data. —A New York Subscriber



I CERTAINLY hope that I can shake some "magic" out of my sleeve to help you in overcoming the trouble you are experiencing on the brakes on the Hudson and Terraplane cars.

The first thing that I would do, and which won't cost you any money, is to secure some long coil springs and put them around the outside of the brake drum. Springs similar to those used for closing screen doors can be used. If possible, secure springs of about ½-in. diameter. These coil springs passing around the entire circumference of the brake drum will assist not only in improving cooling but will serve to damp out the squeal.

You may recall that Cadillac used this as standard equipment several years ago.

I would also pay particular attention to the wheel bearing adjustment for both front and rear wheels. My theory in this is that there may be enough play present to permit the drum to rub against the backing plate. I would also make sure that the small coil springs which serve to draw the shoes against the backing plate are correctly adjusted. If these steady rest springs are too weak, it will result in the trouble you are experiencing and if they are too strong it will result in sluggish action.

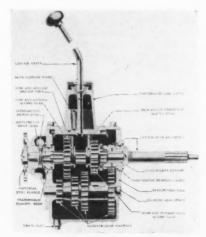
The trouble might also be caused by the brake backing plate being too thin. If such is the case, there is nothing much that you can do about it, though you might try welding on some reinforcement ribs on the outside of the backing plate which would serve to strengthen them.

On the Terraplane, after 10,000 miles of driving, you state that you

get a hard pedal pressure, my guess is that you have slipped up somewhere in re-centering the shoes, particularly since you state that the lining wears thin on one end only. I would suggest that you check the shoe-to-anchor springs and see that they are installed in accordance with the instructions given in the Chilton Brake Book under the heading "Important Bendix Data."

TRANSMISSION? FAN? WHO KNOWS THIS ONE?

I would like to describe to you a very peculiar noise in a Marquette automobile. This car has about 65,000 miles to its credit. The noise, in question, comes in at around 38 to 45 miles an hour and it remains as long as the wheels are not pulling the engine, or when the engine is not pulling the wheels. In other words, just gliding along at this speed only. At first, this noise could be eliminated entirely by just touching the clutch pedal enough to make contact with the carbon disc. It had a noise which sounded very much like a loose ball bearing assembly. On the first take down, we installed a new flywheel pilot bushing, new transmission front ball bearing and the noise seemed to be gone. When the car went out, the noise appeared again after about 50 miles. The second time the job was down, we installed new clutch throw out fingers, pins and all of the parts that hold the carbon disc in place. Then the noise was entirely gone for about 250 miles, but now it's in again. This vibration sounds like a loose ball bearing assembly. The transmission was entirely disassembled, none of the other parts seemed to be defective. The countershaft bushings are not tight



on the shaft because some wear being present. This noise sounds somewhat like a Chevrolet 6 does when a drive shaft ball bearing assembly has worn rough and echoes up the torque tube. This car being a Hotchkiss drive and every time the transmission or clutch has been disturbed, the noise has disappeared for a short time. I am wondering what I should do to stop this trouble. The Buick agencies in two different cities have tried to stop this noise as well as ourselves. More information will be sent, if this question is not clear.—A California Subscriber.

DURING the past few years I have had about half-a-dozen queries from readers who have Marquette cars and who were experiencing the same trouble as you. In each case they have done practically everything in an attempt to overcome the trouble and in some of the instances they have installed complete new transmission, drive shaft, and rear-axle and without overcoming the difficulty. Frankly, I don't know what the answer is.

About a year ago, I was discussing this trouble with an experienced Buick mechanic and he swore on a stack of Bibles that it was caused by the cooling fan and claimed that the installation of a new belt and fan overcame the trouble.

Another mechanic, with whom I have discussed the trouble, said that it would be overcome by installing rubber pads between the rear spring and the rear axle housing. And also rubber pad between the rear axle housing and the U-bolts.

You might try installing new countershaft bushings in the transmission and also make a very careful examination of the countershaft gears to make sure that they are not pitted or worn. Also check the alignment of the transmission with the flywheel with a dial gage.

If any of the readers of the Clearing House have experienced similar trouble on a Marquette, a letter telling how they overcame the trouble would be appreciated.



"Somebody on the eleventh floor phoned for a cab"

10,000 Miles on the Speedometer

means that the car, if average, has developed the following

statistics:
Battery delivers 10,000 ampere hours of current.
Coil delivers 90,000,000 charges

of 15,000 volts each.

Spark plug cables deliver a total of 1,350,000,000 volts.

Contact points open and close 90,000,000 times.

Each spark plug fires 15,000,-000 times.

Carburetor mixes 2,810,000 cubic feet air with 825 gallons gas.

Distributor shaft and rotor revolve 15,000,000 times.

Fuel pump pulsates 15,000,000 times.

Speedometer cable revolves 10,000,000 times.

Each valve opens and closes 15,000,000 times.

-Prest-O-Lite News Letter.

SERVICING LOW-SPEED SHIMMY AND WANDER

I have a 1934 Ford V-8, run 12,700 miles, that I service. It has a bad case of shimmy between 18 and 25 miles and pulls to the right at that speed. At 30 or more it will not shimmy and goes straight ahead. Have checked this car all over three times for alignment and looseness and found it O.K. Car has been in two service stations for this trouble and nobody can find it. Can you help me?

— Wm. D. Gifford, West Barrington, R. I.

THE first thing I would do on your 1934 Ford V-8 that shimmies between 18 and 25 miles per hour would be to make sure that the shock absorbers are filled and also that the wheels are correctly balanced.

I would also suggest checking the shackles of both front and rear springs and also make sure that the spring U bolts of both front and rear springs are tight.

Make sure that the front wishbone or radius rod is tight in the axle and that the rear end is also securely mounted.

When tightening the spring U bolts, I would also carefully examine the spring itself to make sure that none of the leaves are broken.

To Properly Adjust Old-Time Carburetor

Will you kindly send me some information on the proper adjustment of a Stromberg carburetor on a 1928 Peerless 80.—A Cleveland Subscriber. CORRECT adjustment procedure for the model OX-2 Stromberg carburetor used on the 1928 Peerless Model 80 is as follows:

The idling mixture and closed throttle running up to about eight miles per hour are controlled by the knurled button, or idle adjustment screw. This operates on the air, so that screwing it in, clockwise, gives a richer mixture, outward a leaner one.

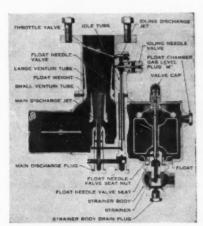
When engine is idling properly there should be a steady hiss in the carburetor. If there is a weak cylinder or a manifold leak, the hiss may be unsteady. For an engine to idle steadily on present fuel the spark plug gap must not be less than .022.

If after adjusting the low speed needle as above described, the engine idles too fast or too slow, turn the small throttle stop screw to the left or to the right until proper speed is reached.

The high speed and main driving adjustment are regulated by the high speed needle. Turning down, clockwise, gives less gasoline.

The following is a good way to obtain the exact adjustment: Advance spark lever to normal driving position; set throttle lever on steering wheel to a position which gives about 25 miles an hour speed on a smooth road; then adjust high speed needle to the minimum opening that will give smooth running, and the maximum engine speed for that throttle opening; this should give a good average adjustment. Several notches less opening may give best economy for continuous driving or touring; and one notch more may be best for short runs in cold weather, when the engine does not get to normal heat.

The economizer device operates to automatically lean out the mixture at speeds from 10 to 45 miles per hour. The economizer is non-adjustable, but be sure it is clean and seating correctly, otherwise you will have



excessive fuel consumption. In all cases the adjustments should be made when the engine has a temperature of higher than 140 deg.



"Oh, well-nothing ventured-nothing gained"

MAKING OLD STAR RUN ON TIME

Would you kindly advise me as to the correct valve timing on a Star six-cylinder motor 14L No. 52752 casting date 11-29-26?

Have had your Flate Rate book ever since I started in business and consider it a very necessary piece of equipment. Would not try to get along without it.—Wm. H. Bacheller, Rose Farms Garage, Madison, N. J.

I AM glad that you have found our Chilton Rapid Flat Rate Manual of such assistance in your business.

To check the valve timing on the Star six, 1926, 1927 and 1928, set the tappets to .012 in. and the intake valve should then open four degrees or 1½ flywheel teeth after top center.

HARD STARTING WITH A WILLYS-KNIGHT

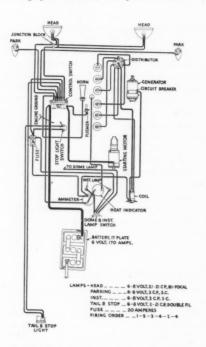
In the past you have helped me when I had a poser, and I am going to trouble you again.

I am having trouble with a 1931 Willys-Knight six. It is hard to start when the motor is cold. In fact, about the only way it can be started is with a tow, even in extremely hot weather. When the car was first brought into my shop I checked the compression; it was O.K. I found the voltage low at the distributor and I located a loose wire on the ammeter. I also found the carburetor loose at the manifold, causing a bad leak. I tightened it, being sure that was the trouble, but no luck. I have installed a new set of spark plugs, new ignition points,

new coil and condenser since then, but it's still hard to start. The car runs perfect and starts easily when the engine is hot.

I notice on a car the same model as this one that there is a wire running to the carburetor. The wire is missing off this car and somebody has a cork plug in the hole. What is this wire for? Does it have any effect when starting? I have tried to trace it, but I can't find where it goes. Please explain fully the reason for this wire.—Julius Erspamer, Gillespie, Ill.

I CERTAINLY was pleased to hear that in the past I have been able to help you in some of your troubles.



Now, in regard to your 1931 Willys-Knight, the wire going to the carburetor supplies current for what is known as a Fuelizer, designed to assist starting. As far as I have been able to learn, this device is no longer manufactured, but quite possibly you could obtain one by writing to Willys-Overland, Inc., Toledo, Ohio.

I believe that you can overcome your difficulties of hard starting even though you do not have this Fuelizer. While it is common practice to use S.A.E. 40 or 50 oil in Knight engines, it is advisable to use S.A.E. 30 or, in cold weather, S.A.E. 10W to secure easy starting. The reason for this is that the heavier oil results in such a drag on the battery that there is very little left for the ignition system.

I would also recommend that you remove the exhaust manifold and carefully scrape out all the accumulated carbon from the manifold and the exhaust ports.

Then, if your ignition system, carburetion system, piston rings, junk rings and pistons are in good condition, you should have no difficulty starting, provided that your battery is O.K. In this connection, a battery that is generally found satisfactory on a conventional type engine will not prove satisfactory on a Knight engine because of the excessive load when starting. It might, therefore, be advisable to try a new battery of increased capacity.

In regard to the ignition coil, quite possibly one of the newer types designed to operate on low voltages would prove of material assistance.

I would also advise making a careful check of your distributor shaft bushing and if this shows any signs of wear I would install a new bushing and shaft. In addition, it might be advisable to ground the distributor housing directly to the frame of the car. I would also remove the battery cables and the battery ground connection and make sure that the connections are all in good electrical condition.

Even though these connections might appear to be O.K. from a careful observation, I would strongly advise removing them and thoroughly scrape all the surfaces so as to be sure that they are absolutely clean.

I am quite sure that if you will follow these instructions that you will have no difficulty in overcoming your hard starting, even without the use of a Fuelizer. Don't hesitate to use light oil such as S.A.E. 20W. It might result in a slight increase in oil consumption, but this will be more than compensated for by the increase in gasoline economy and the ease of starting.

Monthly Prize Contest

For Automotive Servicemen

JOIN the "Money-of-the-Month Club" by being among the winners in this simple, easy prize contest, which is open to all subscribers to Motor Age.

All you have to do to make yourself eligible for a prize is to write a letter on the following subject:

"How I Increased My Winter Service Business"

Write just a short, clear-cut, factful statement telling us what you have done and are doing to improve wintertime profits. Write 250 words, or more if you wish. Neatness and accuracy are important, but contestants will be judged chiefly on what their letters say.

Here Are the Prizes

For the Best Letter \$15.00 Cash

For the Second Best Letter **\$10.00 Cash**

\$5.00 will be paid for every other contest letter, which is published in Motor Age.

Directions for Winning Prize Money

- 1. Read these contest rules carefully.
- Write a statement or letter . . . 250 words or more in length . . . telling "How I Increased My Winter Service Business." Be sure that your name and address are printed clearly on each sheet of paper used.
- Mail your letter to the Contest Editor, Motor Age, Chestnut Street at 56th, Philadelphia, Pa., so that it will be postmarked not later than January 10, 1936.
- The Editors of Motor Age are the judges, and their decision is final. In the event of a tie, duplicate awards will be made.
- 5. The contest is open to all subscribers to Motor Age. No entries mailed after closing date will be eligible. Winners will be announced in a future issue of Motor Age. Employees of the Chilton Company and their families are not eligible to enter this contest.
- Entrants in the contest thereby permit the use of their letters or statements signed with their names and addresses in Motor Age.

You May Win One of These Cash Prizes Send Your Letter Now

Another Money-of-the-Month Contest will be announced in the January issue of Motor Age. But don't miss this month's. It's easy—it's lots of fun and you may be a winner! Address your entries to Contest Editor, Motor Age, Chestnut Street at 56th, Philadelphia, Pa., mail on or before January 10, 1936.



Axle Service Should Include Wheel Balancing

Some Important Tips to Trouble Shooters Who Seek the Cure for Shimmy, Abnormal Tire Wear and Jittery Riding

By Bill Toboldt

WHEN it comes to wheel shimmy, it is possible to give a list of causes as long as your arm. Some of these are important, while others are relatively unimportant and might be classed as contributing to the condition rather than actual causes.

Among the most important and incidentally one of the most neglected is wheel balancing. Of course, caster, camber and toe-in must be checked, but, it is interesting how the importance of wheel balancing is often passed up. And when it is—shimmy, abnormal tire wear and a jittery ride are the result. The abnormal wear in the tires illustrated was caused by an unbalanced condition.

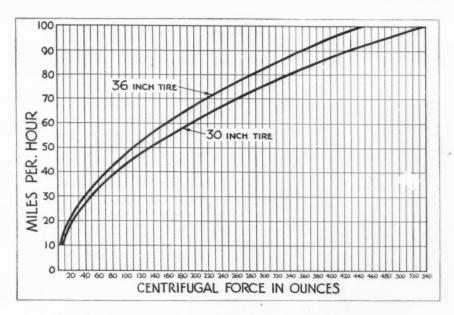
The need for accurate tire balancing is much greater today than ever before. Car factories are balancing wheels before sending the cars out. But that doesn't mean they stay balanced. Tires will wear and, strange as it seems, the installation of a new tire doesn't mean that the assembly is balanced. There are many cases where a car steered perfectly until new tires

were installed and then it shimmied—and how.

The reasons why wheel assemblies have to be more carefully balanced today than a few years ago is found in the smaller diameter tires and the higher road speeds. The smaller wheels will revolve a greater number of times per minute, for a given road speed than do wheels of larger diameter. This added to the higher road speeds increases the effect of any wheel unbalance.

Just how a condition of wheel unbalance affects wheel rotation is very interesting. For instance,

		Centrifugal					
M.P.H.	R.P.M.	force in oz.					
10	112	5.3					
20	224	21.2					
30	336	49.0					
40	450	84.8					
50	561	134.					
60	674	196.					
70	786	269.					
80	898	339.					
90	1008	435.					
100	1120	536.					



Note how the centrifugal force increased with the speed

suppose there is a wheel in perfect balance, that is, any section of that wheel will weigh exactly the same amount as any other section of similar size. When such a wheel is mounted on a spindle and is free to turn, it will never stop spinning in the same position. (Leaving out Old Lady Luck.) If it were out of balance, the heavy portion of the wheel would always stop at the bottom.

Now if a 1 oz. weight is attached to the rim of the wheel, it will be out of balance. When revolved, the heavy portion will tend to fly off with a greater force than any other portion of the wheel. This force, with which the weight tends to fly off is known as centrifugal force and is the same force that holds water in a bucket when it is swung rapidly in a circle.

If the amount of unbalance is increased to 2 oz., the centrifugal force will be twice as great. Increasing the speed, however, alters the picture completely. If the speed is doubled, the centrifugal

force is not doubled but is four times as great. For instance, with 1 oz. of unbalance on a 30-in. tire rolling along at a speed of 20 m.p.h. (224 r.p.m), the centrifugal force would be only 21.2 oz., but when the speed is increased to 40 m.p.h., the centrifugal force becomes 84.8 oz.

The chart and table show the centrifugal force resulting from an unbalanced condition of 1 oz. on both a 30-in. tire and a 36-in. tire.

But just imagine the shimmy or wheel tramp, to be exact, resulting from just 1 oz of unbalance. On a 30-in. tire at 60 m.p.h. there is 196 oz., or nearly 12.5 lb. of centrifugal force. When the weight is at the top, it tends to pull the wheel from the ground. Then when it is at the front of the wheel, it will pull the wheel forward. Next it will pull the wheel down, and so The result is that the axle and wheel fly up and down, and if the wheel on the opposite side of the car is also unbalanced, the driver will sure have his hands full.

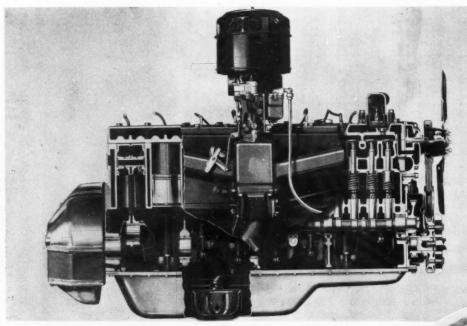
Balancing wheels is a relatively simple job. It takes time and care, but is not difficult. There are all kinds of equipment available to help the service man do the job in the shortest time possible. The job consists essentially of locating the heavy side of the wheel, and then attaching a weight on the opposite side of the wheel to balance the assembly. The size of the counterbalance weight is gotten by the cut-and-try method.

Special counterbalance weights are available.

	36 in. T	ire
м.р.н.	R.P.M.	Centrifugal force in oz.
10	93	4.4
20	187	17.7
30	280	40.
40	373	71.
50	466	111.
60	560	160.
70	654	224.
80	746	283.
90	840	360.
100	930	444

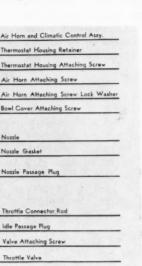


1936 Pontiac 8 Tune-Up



Nozzle Gasket

Fig. 1



Front Brake Assembly



The 1936 Pontiac Eight Engine

Fig. 1

SPECIFICATIONS: Bore 31/4 in., stroke 31/2 in. Piston displacement 232.3 cu. in. S.A.E. rated H. P. 33.8, actual brake H. P. 87 at 3800 r.p.m. Compression ratio 6.2 to 1, which may be reduced to 5.7 to 1 by installation of a special head gasket. Firing order 1-6-2-5-

Ignition timing set by marks on flywheel, left side of engine, timing from No. 1 piston, 4 deg. B. T. D. C. Spark plug make A. C., 14 m/m, model K-7.

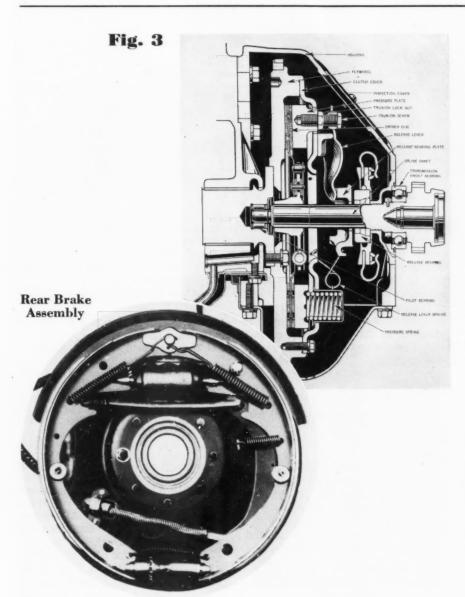
PISTONS: Fitted with two 1/8 in. compression rings above the pin and one slotted 3/16 in. oil ring below the pin. Pistons removed from

CONNECTING RODS: Bearings are steel backed, with cadmiumsilver alloy lined shells, and can be replaced without removing rods from engine. Rods are off-set, and all even numbered rods are installed with the wide side of the rod bearing toward the front of the engine, and all odd numbered rods with the wide side of the bearing toward the rear.

MAIN BEARINGS: Steel backed babbitt bearings, the upper and lower halves being interchangeable. May be replaced without removing the crankshaft. Thrust is taken at the center bearing.

Due to high oil pressure, a fluttering of the oil pressure gage needle and a clicking in the instrument will result if air is impounded between columns of oil in the oil gage line. The line must be bled by disconnecting at the gage, turning the engine over a few times with the starter until oil has displaced the air that may have been pocketed in the line. Use a container to prevent oil squirting out on the seat cushion.

and Overhaul Data





Carter Model 322S Triple-Venturi 1½-in. down-draft carburetor is used on the Eight, and Model 324S is used on the Six. Both have the automatic choke and fast idle built into the carburetor.

There is only one fuel supply adjustment — to regulate the idle. Turning the screw IN provides a lean mixture, and turning it OUT provides a rich mixture. Adjust until the engine operates smoothly. If smooth operation cannot be secured with this adjustment it will be necessary to check metering rod

setting with gage (Carter part T109-26). Metering rod pin in pump arm should rest on top of gage with throttle fully closed and upper end of connector rod centering freely in its hole in pump arm. If it does not, bend lower end of connector rod so that top end centers freely in hole. When making this setting, be sure that fast idle block is up, choke valve wide open and throttle idle screw backed out to where throttle is closed tight. Anti-percolator valve may be set by turning throttle adjusting screw in one and one-eighth turns from a closed throttle position, and adjusting pump arm lip for .002 to .005 in. clearance between lip and valve stem. Be sure fast idle block is held



up while this check is made. The automatic choke assembly is protected by a screen to keep dirt from entering the thermostatic housing. If the strainer screen clogs it will restrict the flow of hot air to the thermostatic coil and cause flooding.

Float level, measured between top of float and underside of bowl cover while holding bowl cover and float in an inverted position, is $\frac{3}{8}$ in. Caution should be exercised in mounting the air cleaner to the carburetor. The neck of the cleaner should not engage the air horn of the carburetor more than $1\frac{1}{8}$ in.

The 1936 Pontiac Clutch Fig. 3

Interchangeable between the Six and the Eight, the new type clutch plate is provided with cushion segments in the facing on the pressure plate side to give smooth engagement. When relining, rivet the plain facing tightly to the flywheel side of the plate with brass tubular rivets. Rivets should not extend through the disc more than 1/32 in. after riveting. Rivet the cushion segment unit to the pressure plate side of the disc, using soft iron rivets with rivet heads in clearance holes on facing and cushion segment side. This operation requires a special riveting fixture, as careful handling is necessary to prevent buckling or warping of the disc. Too much clearance between segments and discs or excessive runout will result in the clutch not releasing cleanly and causing a drag. Do not attempt to adjust or repair clutch hub; if repairs are required, replace the disc.

The only adjustment provided is the clutch pedal adjustment, unless the clutch assembly is removed from the car. With the clutch pedal against its stop, adjust the link screw so that pedal stands $\frac{5}{8}$ in away from the underside of the pedal felt retainer board.

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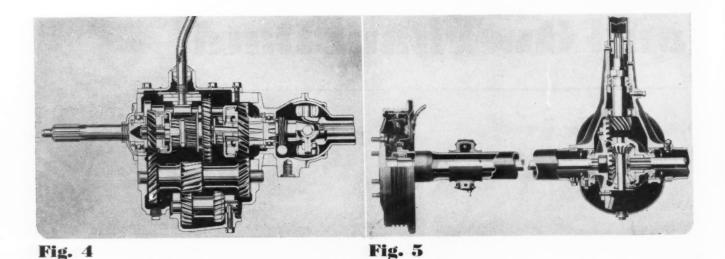
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The 1936 Pontiac Transmission

Fig. 4

The 1936 Pontiac, both Six and Eight, uses the synchro-mesh type of transmission. The snap ring holding the main drive gear in the case is now on the outside of the case, preventing the possibility of damage to the gears in the event of snap ring breakage. To remove, remove snap ring from bearing and drive gear and bearing toward inside of case.

It is not necessary to use Extreme Pressure lubricants in the 1936 Pontiac transmission, and under no conditions should Extreme Pressure lubricants and regular gear lubricants be mixed. Use S.A.E. 160 grade for temperatures above 60° F., and S.A.E. 90 grade for temperatures below 60° F. Capacity is 1¾ pints.

When removing the universal joint, it is necessary to remove the

rear engine support cross member, disconnect the joint and block up the torque tube.

The 1936 Pontiac Rear Axle Assembly

Fig. 5

The Six and the Eight rear axle assemblies are not interchangeable, due to the difference in gear ratio.

The axle shaft is held in place by a horseshoe washer recessed into the differential side gear. To remove, first remove the wheel, then the differential housing cover, press in on the axle shaft and withdraw the washer. Be careful not to injure the oil seals when withdrawing the axle shaft.

Pinion adjustment is obtained by a spacer and shims between the shoulder of the differential carrier and the pinion thrust (or double row) bearing. If it becomes necessary to change this adjustment, the third member has to be removed.

Use S.A.E. 90 lubricant in differential for temperatures below 60° F., and S.A.E. 160 for temperatures above 60° F. Capacity 4½ pints.

Both the Six and the Eight are supplied in a Standard, Mountain and Plains differential ratio, and for Service purposes the ratios may be identified by paint markings in the form of a cross (x) on the end of the axle shaft. These markings

may be seen by prying off the rear hub cap. The code is:

Six Cylinder,

40-9—(4.44 to 1) Standard—green Eight Cylinder,

41-9—(4.55 to 1) Standard—white Six and Eight,

44-9—(4.88 to 1) Mount'n—orange Six and Eight,

37-9—(4.11 to 1) Plains—blue

The 1936 Pontiac Front Suspension Unit

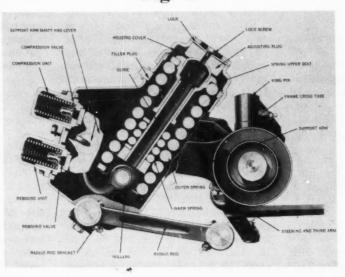
Fig. 6

Used on the DeLuxe Six and the Eight. King pin is now mounted on floating bronze bearings instead of rollers, and is removed by first removing the radius rod bracket, wheel and hub, brake backing plate and shoes as an assembly. Remove king pin, lock pin, plug lock rings and blow out the upper plug. Drive out the king pin and lower bearing

plug, using a brass drift. Start the king pin in from the bottom, and be sure that the longest end of the king pin from the slot is at the top, and that the slot lines up with the lock pin in hole. Dip the bushings in heavy oil before slipping them into the yokes. Front end specifications for the DeLuxe Six and Eight are as follows:

Caster (frame level), 0°; camber (with load on wheels), ¼° to —¼°; toe-in, zero to 1/16 in.; king pin inclination, 8¾°.

Fig. 6





DON'T throw away those old inner tubes. Maybe these girls at the Roney Plaza Cabana Sun Club, in Miami, Fla., have found the most economical bathing suit. Here are the first suits fashioned from an old inner tube, using only a pair of scissors, some white lace and a pencil.



"Stay Independent" Ruark Tells Kansas City Repairmen at Winter Service Meet

The fall general meeting of the Automotive Trades Association of greater Kansas City, presented its "all-star" winter service program and attracted an audience of nearly 250 interested members of the trade. As winter service was stressed, much of the program was directed to the

maintenance shop.

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The program featured an address by B. W. Ruark, general manager of Motor & Equipment Wholesalers Association, Chicago, who spoke on the subject, "The Independent Repairsubject, "The Independent Repairman's Responsibility to His Customers." Among other things, Mr. Ruark stressed the word "independent" and pointed out that independents should be proud of that fact and let the trade know it. "By being an independent," he said, "and staying an independent you can exercise that rugged individualism which constitutes one of the basic fundamentals of American progress. As an independent you are best in a position to discharge your full responsibility to your customer. Protect that independence as one of your most valued assets and eternally guard against entering into contracts or agreements which to any degree will rob you of your freedom and cause you to surrender any portion of your right to spend your own money where you want to spend it and to run your business as you prefer to run it and as you feel your own as well as your customers' best interests will be served."

In covering his subject, the speaker touched upon the following service fundamentals which constitute a major share of the independent repairman's responsibility to his cus-



B. W. Ruark

". . . By being an independent you can exercise the rugged individualism which constitutes one of the basic fundamentals of American progress."

tomer: The importance of being an A-1 mechanic; the need for proper and modern equipment; the necessity for using only quality merchandise; the requirement for honesty and dependability; the necessity for keeping up to date by taking and reading every month at least one good trade publication and acquire the ability to apply the valuable information which they contain; the importance today of a clean, attractive place of business and that there is no substitute for courtesy, thoroughness, accurate, honest prices and continuous merchandising effort.

Bigger Crowd Attends Service Industries Show

What was expected to be one of the most successful Automotive Service Industries Shows on record closed December 13, in Atlantic City, N. J., completely surpassing the anticipation of its Joint Operating Committee, according to reports.

The Show was operated under the joint sponsorship of the N.S.P.A., M.E.M.A. and M.E.W.A.—manufacturer and jobber associations. It continued a full week, Dec. 9 to 13.

Jobbers attending the show were there to make personal contacts with factory executives, to secure new lines, to hear about new sales and advertising campaigns and to pass judgment on them, to compare notes with fellow jobbers from all parts of the country, to voice opinions on distribution policies and trends—all of which caused the hustle and bustle last week in Atlantic City.

The exhibits at the show displayed many new developments in replacement parts, shop equipment, accessories, tools and supplies, the majority of which are described elsewhere in these columns.

The show was a complete "sell out" on the basis of the number of exhibitors and the amount of floor space used for exhibits.

The exhibition was, as in previous years, a "closed show." Attendance privileges were available only to members of the three sponsoring associations, on Dec. 9, 10, 11. However non-member jobbers were invited to attend on Dec. 12, 13. The closing day was open to all branches of the retail maintenance trade within traveling distance of Atlantic City.

Improved Sales Offset Slack In Auto Show Crowds

The automobile shows are over. The annual display of new car models, where dealer and manufacturer cooperate in an effort to attract the motoring public and the industry at large to newer, brighter, more dependable automobiles, spread from city to city from early November and, with a few exceptions, are now concluded.

Attendance in many instances was smaller than the shows of January, 1935, according to reports, but gain in sales generally offset these decreases in attendance figures.

Alfred Reeves, A.M.A. general manager and manager of the New York show, announced that the first fall show proved to be "the largest retail selling show since 1929." Some companies, Mr. Reeves said, "have almost doubled their sales with the average more than 60 per cent above those for the show last January."

One notable exception to the slack attendance trend was the Chicago Automobile Show, which set a new alltime high mark for attendance and a reported increase in sales of approximately 40 per cent.

The Philadelphia show, opened by

the running of its now famous Antique Derby, produced sales and prospective sales for Quaker City dealers even though attendance may not have broken any records. The same is reported from other cities, where sales gains offset slack attendance. Among these were Washington, D. C., San Francisco, Los Angeles, Brooklyn and Buffalo.

Detroit came through with another successful year. The Detroit show closed with an attendance for the eight days of approximately 125,000 persons and floor sales of 1412 cars and trucks with aggregate value of \$1,129,600, making it the most successful show since 1929.

New Financing Plan Used To Aid Bear Service Men

Will Dammann, president of the Bear Manufacturing Company, has announced that Bear alinement equipment is now available to automobile service stations and garages at low interest rates on monthly payment arrangements running as long as three years.

This plan applies to practically all Bear service equipment, which includes wheel alinement gages, axle presses, frame straighteners, wheel straighteners and accessory tools.

October Registrations Up 5% Over '34 Month

Service station men watch new car registration with an eye to future business. New car registrations for October amounted to 148,389 as compared with 140,937 during October, 1934, and 157,098 during September of this year. This is an increase of approximately 5 per cent over a year ago, but represents a decline from September of about 5.5 per cent. Ford was in first place with registrations amounting to 38,311, Chevrolet was second with 34,869 and Plymouth maintained third place with 16,518.

For the first ten months of 1935, new car registrations amounted to 2,286,452 as against 1,705,627 for the same period last year, a gain of about 34 per cent. During this period the three leading manufacturers, Chevrolet, Ford and Plymouth, accounted for 1,571,014 units or 69 per cent of all sales. A detail summary follows:

New Car Registrations

Per	0	2	e	n	t	١	C	: 1	1	a	n	a	le	4		
10 Months, 1934			*	*		*					*					1,705,627
10 Months, 1935																2,286,452
October, 1934 .																140,937
September, 1935																157,098
October, 1935 .																148,389

October, '35 over '34 + 5. October, '35 over Sept., '35. - 5. 10 Mos., '35 over '34 + 34.

GREAT was the Auto Show! The brilliance of new models, the triumph of skillful engineers, the smartness, the color...all were a supreme demonstration of modern transportation, BUT SOMEBODY NEEDED A MECHANIC! Yes, even at the auto show the services of a good repairman are apparently indispensable, for the eagle-eye of a camera caught this knight of the overalls (shown at the bottom of the picture) just as he was about to go into action under the hood of a spanking new car.



Schindler Cops Crown In Hazleton Midget Race

Bill Schindler, Schenectady, N. Y., speed demon driving a two-cylinder Schroeder Special, won the feature event of the Armistice Day midget auto races on the fifth-mile Buhler dirt track at Hazleton, Pa., before 2000, to be crowned Anthracite Region Champion last month. His time for the ten laps was three minutes, eight seconds, the best of the day over that distance.

Twenty-eight midget cars, most of them two cylinders with a few fours, took part in the events, sanctioned by the Midget Auto Racing Association of America and staged for the benefit of the Crippled Children's Association of Hazleton and vicinity.

Bill Troutwine, piloting a Waller Special, a two-cylinder machine, finished second, and Joe Angelonie third

in his two-cylinder job.

Schindler also took the first eightlap qualification heat in two minutes, 34 and four-tenth seconds and also the third handicap race of ten laps, the time three minutes, 27 seconds.

Greater Water Capacity In New Prest-O-Lite

Winter customers may be inquiring about the new Prest-O-Lite Hi-Level battery, type H1-17, which is said to have four times the usual water space, and in normal service to require re-watering only three

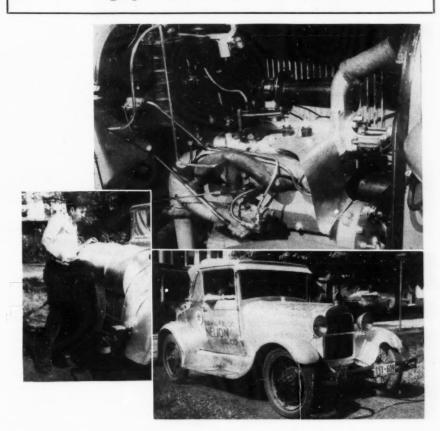


times a year. The separators are wood and rubber and the positive plates are 3/32 in. thick. The plate corners are rounded and beveled to minimize the buckling effects of overcharging. This battery, which is made by the Prest-O-Lite Battery Co., Inc., of Indianapolis, Ind., has 17 plates per cell and is rated at 110 amp. hrs. When sold in exchange for the old battery, the price is \$12.45.

Grey-Rock Pump Packing

Repairmen who are familiar with Grey-Rock brake linings will recognize the new Grey-Rock water pump packing developed by the U. S. Asbestos Division of Raybestos-Manhattan, Inc., Manheim, Pa. It is semimetallic, consisting of asbestos fibres and non-frictional metal in ring form.

Equips Ford to Run on Fuel Oil



A non-stop, non-refueling run from Peekskill, N. Y., to Miami, Fla., in 41 hours at a fuel cost of less than \$2.50 is the claim of Robert MacKellar of Peekskill, N. Y., owner and operator of a Ford car which he has equipped to run on No. 2 grade of fuel oil.

A 78-gallon drum is installed in the rumble seat compartment, and the conventional vacuum tank is employed to lift the fuel oil to the carburetor. The fuel line is wrapped around the exhaust manifold to pre-heat the oil before it enters the carburetor. The air intake at the carburetor is equipped with a "stove" taking heat from the exhaust pipe to prevent a cool blast of air from striking the fuel. Vaporizing is further assisted by passing the fuel through a fine wire mesh screen between the carburetor and the intake manifold.

The engine is started on gasoline, using the regular gravity feed common to the Model A Ford. After the engine has become thoroughly warmed up, the driver cuts off the gasoline and cuts in the fuel oil.

Details of New Watson Co-Dampers; Designed to Give Smoother Ride

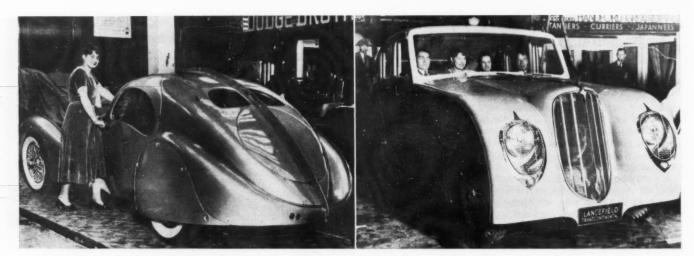
The John Warren Watson Co., Philadelphia, Pa., has recently developed a device to control the pitching and swaying motion sometimes experienced with cars having very soft springs. These Watson Silenite Co-Dampers, as they are called, are designed to be attached to and cooperate with the existing shock absorbers, and are adjustable to give any desired degree of stability and firmness. Co-Dampers operate on the friction principle and are said to be capable of resisting and controlling any slow motion without "locking-up" during rapid movement. They operate without bearings or bushings, all resistance being produced by pressure and movement against two floating discs

of Silenite material, which is said to remain squeakless under all conditions.

At present Watson Co-Dampers are being offered only for certain lowprice cars, but equipment for other makes will be produced later. Retail price per set, front or rear, \$8.40.



AGE



TWO innovations in 1936 automobiles featured at the recent 29th annual British Motor Show, held in London recently. On the right is a four-abreast Lancefield Transcontinental Model, with the chassis built over the wheels allowing four people to sit comfortably on the front seat. At the left is the new streamlined Bugatti, finished in aluminum. It has the appearance of an armored car as segments of the body are riveted together.

Price Stabilization Aids Tire Dealers

The tire industry's price stabilization and new discount program which was put into effect the forepart of November had the effect of reinstating May 3 price levels, it is reported. Orders were issued by manufacturers to all branches, companyowned stores and distributors to stop at once all discounts and special rebates.

The reinstatement of May 3 price levels brought the "going price" of tires up to within 10 per cent of the lists established under the NRA's emergency decree for the tire industry. Theoretical lists are still at 100 per cent, with the selling level at 90 per cent (May 3 level) on first line casings. With the theoretical list at 85 per cent on second line tires, the "going price" becomes 77½ per cent and the "going price" on third lines becomes 66½ per cent against a "list" of 70 per cent.

Following the announcement and enforcement of the new price program manufacturers then set about the task of re-aligning discounts so as to increase discounts and bonuses for small dealers. This was done through a slight reduction of bonuses and discounts for larger distributors, the net result producing about a 2½ per cent average increase in the manufacturers' recovery.

Under the old standard earned bonus program the small dealer received a volume bonus of about 1 per cent on \$1,000 worth of business a year and 2 per cent on \$2,000. The maximum bonus was 12½ per cent on \$35,000 or more per year. The new bonus schedule starts the small dealer off with a 2½ per cent bonus on \$1,000; 5 per cent on \$2,000; 5½ per cent on \$2,500, and scales up to a maximum of 10 per cent on \$20,000 or more.

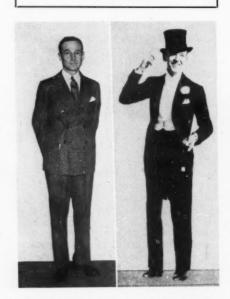
Special discounts have also been

changed on individual orders direct from the factory. Heretofore a directfactory order of 20,000 pounds or more produced a 3 per cent special discount. So that smaller dealers might benefit, this discount has been changed to 2 per cent on 10,000 pounds or more.

Spring-dating solicitations were started by all tire manufacturers November 11. Under this program dealers, both large and small, can order now for future requirements, receiving one shipment before January 1 and one shipment after the first of the new year. Payments are

(Contined on page 98)

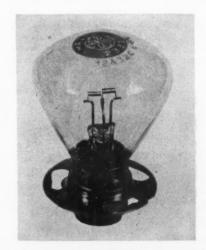
Best Dressed



Edsel Ford, a leader in the Ford Motor Co., was named a leader in men's styles last month by a group of New York tailors. Mr. Ford topped the list of ten best-dressed American men of affairs. Fred Astaire, the top-hat dancer-actor, MGM movie star, was also included in list.

New GE Headlight Bulb Gives Better Lighting

The General Electric Co., Cleveland, Ohio, has introduced a new design headlight bulb in which the filaments are in bar form instead of



the conventional V-shape, and are located side by side with one slightly above the other. In switching from the driving to the passing beam, both headlights are directed more to the right and somewhat lower, providing increased illumination along the edge of the road and giving relief to the oncoming driver. This new bulb, which is designated "Mazda No. 2331," has a prefocused base, but the contacts are so postponed that these will only line up in headlamps that have been specially designed for its use. Several 1936 cars are so equipped.

Briggs Buys Detroit Tigers

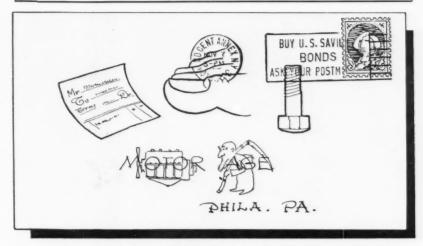
Walter O. Briggs, president, Briggs Manufacturing Co., has become sole owner of the Detroit Tigers Ball Club, having exercised his option to buy the half interest owned by Frank J. Navin.

Sealed Power Designs New Piston Expander

The Sealed Power piston skirt expander, recently announced, is designed so that outward tension is exerted at right angles to the wrist pin and entirely across the slotted side of the skirt. This expander, it is claimed, does not merely open the slot but restores part of the original shape and circularity of the entire piston skirt, permitting the piston to be fitted with the standard factory clearance. Since the rocking action of a piston takes place around the pin, the steadying action should be as far below that pin as possible, and for this reason the Sealed Power expander is installed at the bottom of the skirt as illustrated. A special tool is provided for cutting a groove in the skirt into which the expander fits, eliminating the possibility of its getting out of place or falling into the crankcase. The retail price is 50 cents each. This device is a product of the Sealed Power Corp., Muskegon, Mich.



Bill Toboldt: "Believe It Or Don't"



A letter mailed from the New York Automobile Show, addressed as shown above, was delivered direct to Bill Toboldt, editor of Motor Age. That's one for Bob Ripley's "Believe It or Not."

Weidenhoff Analyzer Is Portable Unit

As a smaller companion to the model P, model H Moto Vita carburetor analyzer has just been put on the market by Joseph Weidenhoff, Inc., 4346 Roosevelt Road, Chicago, Ill. It is a portable outfit and may be removed from the stand and carried about by the handle. Since a certain amount of water



vapor is always present in exhaust gases, provision has been made in this instrument for draining this water automatically so that it will not collect in the element chambers of the analyzer. The combustion meter uses the Wheatstone Bridge method of analyzing exhaust gases, which is claimed to be one of the most accurate methods.

"If You're Going to Drive Fast" is the title of a new book by Ray W. Sherman, old-time automobile trade paper editor. In his book, Mr. Sher-man advises against speed, but takes the stand that auto drivers are going to drive fast. Drivers young and old must be shown how to drive fast with safety, is the viewpoint expressed by Mr. Sherman in his book. The book has been published by Thomas Y. Crowell Co., New York.



DISCUSSING safety problems (left) W. S. Knudsen, executive vice-president of General Motors, meets Governor Harold G. Hoffman of New Jersey at the recent Safety Congress in Louisville, Ky. Also shown are John E. Long, retiring president of the National Safety Council and W. H. Cameron, managing director of the Council. (On the right) Fred Lawrence, automobile painter of Oklahoma City, paints with his spray gun as a hobby after shop hours. He recently demonstrated his ability at the New York Auto Show.

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"I Got Shoes-You Got Shoes"



Any old automobile shoes will do, among the natives of Kurdistan, in Central Asia. All that is needed is an automobile tire plus a little native ingenuity as shown in the photo. Shoes are fashioned out of strips cut from discarded tires. The tops of the shoes and socks are made from wool and hair of sheep and goats.

Rhode Island Repairmen Co-operate in Trade Assn.

The Blackstone Valley division of the Master Automobile Repair Assn. of Rhode Island, held a Thanksgiving party, November 25, to celebrate the fifth year of the founding of that organization.

Regular meetings of this division are held twice a month at the repair shops of association members. This practice, it is found, leads members to keep their shops cleaned up—members competing with each other in cleanliness and attractiveness in their places of business.

The state association is divided into three groups, of which the Blackstone Valley is one division. Others are the Providence division and the Kent County Gargagemen Asso.

Kent County Garagemen Assn.
Officers of the state associations are: Frank E. Domina, president; George D. Hall, secretary; Henry A. Mathieu, financial secretary, and

George D. Hall, secretary; Henry A. Mathieu, financial secretary, and Raymond A. Gladding, treasurer.

Of the Providence Division, the leaders are: George D. Hall, president; H. M. Manchester, vice-president; Frank E. Domina, secretary; Raymond A. Gladding, treasurer. Board of Directors: George D. Hall, M. Manchester, Raymond A. Gladding, Frank E. Domina, Rocco Rosati, John B. Lavalle.

Of the Blackstone Valley Division: Charles L. Reed, president; F. M. Jenoch, Jr., vice-president; Henry A. Mathieu, secretary and treasurer. Board of Directors: Charles L. Reed, F. M. Jenoch, Jr., Henry A. Mathieu, Jean Alex, Lawrence Guisti, Stephen Madsen.

Of the Kent County Garagemen Assn.: Otto W. Olsen, president; Oscar Arcand, vice-president; George H. Richardson, recording secretary; Telespore Despree, financial secretary; E. Stanley Moore, treasurer.

Allen Announces New Testing Equipment

The Allen Electric & Equipment Co., 2101 N. Pitcher St., Kalamazoo, Mich., is introducing a new motor tuner, model E-166, which is portable so that it can be easily moved to the car being tested. With this outfit it is possible to make complete electrical tests on the battery starter, generator, etc. AC current is used for the coil and



condenser heaters, while all other tests are made with the 6-volt battery located in the cabinet.

Another piece of test equipment just announced is the model E-240 electrical laboratory, which is described as a high-speed test stand for present-day cars. A feature is the method employed for testing generators. The electric motor used for driving the generator operates at a constant speed of 1750 r.p.m., all variations of speed being accomplished through variable pitch pulleys. Four sizes of motors are available from 1½ to 4 hp. Magnetos can be mounted on the elevating table and tested at all speeds from 100 to 6000 r.p.m.

Black & Decker Adds A New ½-Inch Junior Drill

As a companion to the ¼-in. Junior drill recently announced, the Black & Decker Mfg. Co. of Towson, Md., has just added a ½-in. Junior drill designed to drill holes in steel up to ½ in. diameter and to drive wood augers up to 1¼ in. diameter. Equipped with a universal motor for either AC or DC current this new model can be supplied for 32, 110, 220 or 250 volts. This drill weighs 10½ lbs. and retails for \$35.00.

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Laminated Offers Shim Stock Dispensing Unit

A new shim stock dispensing unit recently developed by Laminated Shim Company is designed to save time and space in stock rooms, tool rooms and repair departments . . . and to save cutting-space on counters and work benches.

It keeps all sizes of stock together in one place, and can be hung in the location most convenient for everyone.

It holds all thin shim stock and 2 x 9 Laminum strips in a space smaller than most wall calendars occupy.

The unit is available without charge, being supplied with a special assortment of shim stock. Carried by jobbers and dealers, or may be ordered from your nearest Federal-Mogul warehouse.

Houston Maintenance Men Name A. N. Beem Secretary

A. N. Beem has been engaged as full time secretary of the Houston Automotive Maintenance Assn. Mr. Beem is from San Antonio and is an attorney at law.

Blackhawk's Hydraulic Jacks Streamlined

"Wings" is the name of the new streamlined hydraulic jack manufactured by the Blackhawk Mfg. Co., Milwaukee, Wis. It is made with the entire base, reservoir, cylinder and pump in a one piece die-casting. The model TA-7 is of 1½ ton capacity designed for passenger cars and light trucks. The low height is 7 in., the hydraulic lift, 5½ in., the hand screw adjustment, 2¼ in. and total height, 14¾ in. Wings jacks retail for \$4.25 each. Furnished in six colors.

1936 License Plates

License plate colors, as announced by the American Automobile Association, reveal that plates of 30 states and the District of Columbia will have new color combinations. Fifteen states will merely reverse standard color schemes, putting the 1936 text in the color of the 1935 background.

Tennessee has not as yet selected its 1936 colors, but other states will offer license plates—at about half the annual cost of gasoline taxes—in

these colors.

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these colors:
AlabamaCrimson on White
ArizonaBlack on Copper
Arkansas
CaliforniaBlack on Orange
Colorado White on Blue
ConnecticutGold on Blue
Delaware Old Gold on Rlue
Florida White on Red
GeorgiaOrange on Dk. Blue
IdahoBlack on Orange
Illinois
IndianaCream on Crimson
IowaBlue on White
KansasBlack on Orange
Kentucky Aluminum on Black
LouisianaBlue on Olive MaineWhite on Black MarylandWhite on Black
Maine
MarylandWhite on Black
MassachusettsWhite on Maroon MichiganBlack on Grey
MichiganBlack on Grey
Minnesota White on Blue Mississippi White on Black
Mississippi White on Black
MissouriBlack on White
Montana Black on Rust
NebraskaAluminum on Black
NevadaSilver on Blue New HampshireWhite on Green
New Jersey Orange on Black
New Mexico Taos Blue on White
New YorkOrange on Black
North Carolina Green on Black
North Dakota. Dk. Blue on Dk. Orange
OhioBlue on White
OklahomaBlack on Yellow
OregonBlack on Aluminum
Pennsylvania Blue on Yellow
PennsylvaniaBlue on Yellow Rhode IslandWhite on Black
South Carolina Black on Yellow
South CarolinaBlack on Yellow South DakotaWhite on Maroon
Tennessee
Texas
Utah
Vermont Rlue on White
Virginia Orange on Dk Rlue
Washington Blue on White West Virginia Yellow on Black
West Virginia Yellow on Black
Wisconsin
Wyoming
Dist. of Col Black on Yellow

Fisherman's Trailer



This mammoth black bass (the one you hear about in fish stories) was used as a trailer in American Legion parades in St. Louis. It came from Camdenton, Mo., in the Ozark region, along the beautiful Lake of the Ozarks.

Helper Springs For Ford And Chevrolet Trucks

The Service Spring Co., 735 St. Paul St., Indianapolis, Ind., is marketing the No. 134 helper spring for Chevrolet 1½ ton trucks. This spring has 6 heavy leaves 2½ inches wide, two of which extend full length. A specially designed spacer block is claimed to insure strength and proper fitting of the spring. The retail price per set is \$14.

This company has also just announced a new helper spring model FV-326 designed for the 1936 Ford ½ ton truck. These springs retail for \$15.00 per set.

Ancient Steamer



Shown in the current movie, "Ah Wilderness," Eric Linden, one of the actors, drives this ancient Stanley steamer dug out of storage for use in the picture.

Monthly Battery Service Is Part Of New Sales Plan

Batteries will now be sold to car owners along with a guarantee certificate based on service coupons



covering each month of the adjustment period in the new Edison-Emark merchandising plan.

Each coupon, brought in at the proper interval by the purchaser, entitles him to free battery inspection and servicing. The customer buys not only a battery but trouble preventive service for its normal life at no extra cost.

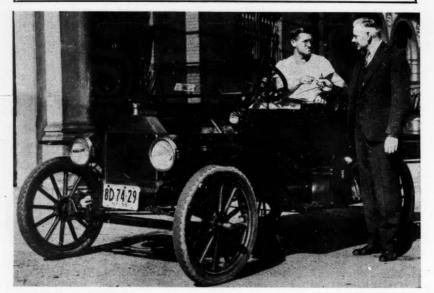
In explaning this Edison-Emark idea Mr. B. F. Morris, vice-president of Thomas A. Edison, Inc., Kearny, N. J., said:

N. J., said:

"There is one coupon for each month of the battery adjustment service period. To take full advantage of its terms the buyer agrees to present a coupon approximately every 30 days to an Edison-Emark dealer or service station. This secures for him free inspection and servicing.

"It makes the customer feel he is getting something more than a good battery when he makes his purchase."

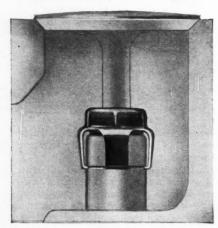
Old Model T Becomes Smithsonian Exhibit



One of Henry Ford's early Model T's has been presented to the Smithsonian Museum, Washington, D. C., to stand beside the prehistoric and extinct relics of the past. The 1913 touring car, shown above, is complete with the bright brass banded radiator and is in excellent condition. It was presented by Harvey C. Locke of Samsonville, N. Y. The car made the trip to Washington, traveling 356 miles in 15 hours, and averaging 17 miles per gallon.

Wilco Valve Stem Packing Designed To Stop Worn Intake Guide Leakage

The new Wilco valve stem packing is designed to prevent air or oil from leaking through worn intake valve



guides. This latest product of The Wilkening Manufacturing Co. of Philadelphia, Pa., is said to be made of a special material unaffected by oil or gasoline, even at high temperatures, and so dense that oil cannot be drawn through it. Wilco packings are installed on intake valves only, and are placed on the combustion ends of the guides, so that they do not interfere with the normal lubrication of the valve stems. To install, the packing is placed on the steel pilot pin furnished, and this pin is inserted in the valve guide from above. The packing cage is then revolved with a socket

wrench and the cutting edges of the gripper prongs cut a groove completely around the guide, locking the packing in place.

Purolator Vise Fits All Oil Filter Makes

The new Purolator vise, designed to fit all makes of oil filters, is made of steel and has jaws so placed that they form a cradle. A metal clamping band fits over the filter and holds it in place without danger of pressing out of round. This vise in addition to being used to hold oil filters while the fittings, etc., are being removed,



can also be used to hold pistons while the ring grooves are being cleaned. It is a product of Motor Improvements, Inc., Newark, N. J.

Intake and Exhaust

S AM, the serviceman, had a fast one pulled on him recently. A customer pulled up to the gas pump and shouted, "Give me a Dionne."

"What's a Dionne?" asked Sam.
"Five gals," his customer replied.
"Five gals!"

That story about the two fellows who were driving on the Virginia Skyline highway last month interests us. Chiefly because they poured a pint of 20-year-old "likker" in the gas tank to coax their car four miles from a point where they ran out of gas to the nearest service station.

Using 20-year-old whiskey in the gas tank is either wise or foolish... depending on how you look at it. True, they didn't have to walk four miles for gas, and the pre-war stuff was safer in the engine than in the driver... but our old friend Sam the serviceman can't figure anything but what those two guys were awful extravagant!

There are only two kinds of drivers—reckless drivers and wreckless drivers.

Remember this:

When you overcharge a man, you make him sore.

When you under charge him, you make him suspicious.

A fair price for all collars the dollars.

Serviceman: "What model is your car?"

Customer: "It isn't a model; it's a horrible example."

* *

It's easy enough to be pleasant, When troubles are light as a feather;

But the fellow worth-while is the guy who can smile When fitting a carburetor to-

gether.

—Clipped from Penna. A.M.A.

News.

Mechanics Service School

How do you synchronize ignition points?

Is it better to say, "You ought to have new rings," or "New piston rings will reduce your oil bill"?

Give five causes for high oil con-

Which is wiser to say, "Your brakes aren't much good," or "New brake linings will reduce driving hazard, at a very nominal cost"?

What are the principal causes for wheel shimmy?

Can you answer these?

—Ty.

Palmer Wedge Bolt for Full-Floating Front Brakes

The Palmer 2051X brake wedge bolt for Ford cars is designed to give full-floating action on the front wheel brakes of cars made prior to 1935. The equalizing pin is case hardened and permits the brake wedge to move horizontally as well as vertically. Braking action is said to be always centered, resulting in even contact of the lining and drum, with consequent improved stopping power. Groan and chatter of the brakes are also eliminated, according to The Palmer Manufacturing Co., 1131 Roosevelt Rd., Chicago, makers of this device.



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Dashboard Socket Charger Builds Up Battery In Car

The dashboard socket battery charger, made by the United American Bosch Corp., Springfield, Mass., makes it possible to charge a battery over night without removing it from

Ford V-8 Engine Used in "Flying Fliver"



The excessive initial cost of the average airplane engine, as well as the operating and maintenance costs, has been one of the chief factors in retarding the development of a small airplane for private flying or for school instruction. An indication that progress is being made in overcoming this difficulty is found in the report of the successful use of a Ford V-8 engine in a two-place monoplane by the Arrow Aircraft and Motors Corporation of Lincoln, Neb.

Mechanical changes in the engine to adapt it for airplane use consisted mainly of the installation of reduction gears in place of the flywheel to drive the propeller, the elimination of the regulation two water pumps and the substitution of one pump, an aluminum crankcase and smaller generator to reduce weight and the redesigning of the radiator to conform to the streamlining of the ship.

Using regulation automobile gasoline and oil, the engine consumed six gallons of gas per hour at full throttle and one pint of oil for every five hours, during a 250-hour test. Cruising speed of this ship is slightly better than 100 miles per hour.

the car. The charger operates from a standard 110-volt lighting circuit and gives a tapering charge from 4 to 2 amperes. The retail price of this out-fit is \$8.00.

Exide Hycap Battery Has Mipor Separators

The Exide Hycap battery, a product of the Electric Storage Battery Co., Philadelphia, Pa., is available with either wood or Mipor separators,



the latter being an Exide product which is said to combine the characteristics of both rubber and wood. It is practically non-destructible, and its high conductivity which permits the battery to respond instantly is claimed to be a great aid to cold weather starting.

This company has also developed a Sure-Start tester to show the condition of a battery. It indicates separator failure and also shows plate wear.

"Open For Business—We Need It"



When the recent earthquake at Helena, Mont., ripped apart Clark's Service Station, it left its owner undaunted. Reconstruction began almost immediately and his sign, "Open For Business, We Need It" testifies that neither snow, nor rain, nor heat (nor earthquake for that matter) can keep a good service station from being on the job 24 hours a day.

Shop-Built Racer



Four views of a classy job, built in his spare time by Gus Schumacher, who runs the Prospect Auto Service, Yonkers, N. Y. It has a Stutz engine and chassis. The engine is rebuilt and equipped with four carburetors. Other revisions include magneto, distributor, crankshaft, camshaft, valves, oil system and cooling system. Its finish is highly polished, unpainted aluminum and chrome.

Independent Tire Dealers Elect Officers at Meeting

The National Assn. of Independent Tire Dealers, at their recent convention, elected the following officers: George J. Erlinger, New York City, president; James J. Bradburn, Philadelphia, vice-president; George J. Burger, executive secretary and general manager. Directors are: Thomas J. Lane, Jersey City; George J. Eberhardt, Chicago; Harry Nelson, Brooklyn; Martin Barry, Baltimore; Joseph Walsh, Jacksonville; J. Calloway, Denver, and A. B. Chapman, Los Angeles. Executive committee includes T. J. Lane, J. J. Bradburn and Harry Nelson.

K. C. Garagemen Sell "Protected Parking"

To "sell" the facilities of downtown Kansas City parking garages, members of the General Parking Assn., a division of the Automotive Trades Assn. of Greater Kansas City, joined hands in a cooperative advertising campaign recently.



Using dominant newspaper space in local papers, 15 garage and parking station operators, representing a total of 40 parking units, displayed the location of parking lots rather effectively in a map of downtown Kansas City.

"Protected Parking" is the idea sponsored in the advertising and each member is identified by a large metal sign and emblem. The convenience of location, the availability from any part of the downtown section, the large amount of available parking space and low cost are factors stressed in the advertising copy.

The campaign costs each operator about \$7 per unit per month and the total cost will be \$1,100 over a period of four months.

Par Electric Lift Has Capacity of 7500 Lbs.

The Par electric lift, manufactured by the Modern Equipment Corp., Defiance, Ohio, is operated through four large nuts rotating around four large acme thread screws which are located in each corner. Drive is through a roller chain from the 1½ hp. reversible electric motor. Since the nuts will not revolve on the screw threads without power application, the lift is said to be in a positive safe



condition wherever stopped, making it unnecessary to provide manually operated safety devices.

The supporting cross members, both front and rear, are made of anchor beam section, making it unnecessary to provide run-ways for rolling a car on or off the lift. This construction also permits using the equipment as a jack for raising the front or rear of a car for service work. A feature claimed for this lift is the elimination of all obstructing braces that would interfere with complete accessibility when working on any part of a car.

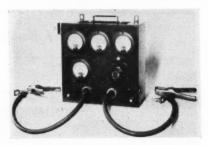
Moto Vita Is New Exhaust Gas Analyzer On Market

The model H
Moto Vita carburetor analyzer
just announced
by the Moto
Meter Gauge &
Equipment Corp.,
LaCrosse, Wis.,
uses the Wheatstone Bridge
method of analyzing exhaust
gases. An exclusive feature is
said to be the
new self-draining



device. There is always a certain amount of water vapor in exhaust gases and this is now drained off automatically. The analyzer is mounted on a portable stand so that it can be moved from car to car if desired.

Westinghouse Offers New Rectigon Battery Tester



In order to accurately show the condition of each battery cell under actual load conditions, the Rectigon tester provides an adjustable load which closely approximates starting The ammeter indicates conditions. the load up to 300 amperes, while the three voltmeters indicate the individual cell voltages simultaneously, the scales being labelled "Charged," "Discharged" and "Dead." The test clips which are made heavy enough for the largest battery make all connections in one operation. A carbonpile rheostat regulates the load. The retail price of this tester is \$30, and it is manufactured by the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

N. Y. Independent Accessory Dealers Form Cooperative

The first general meeting of the Sentry Stores Agencies was held recently in New York City.

The object of the organization is to "create a cooperative link between independent automotive dealers by offering a merchandising service."

The movement, according to reports, places the independent accessory dealer in a better competitive position with other stores.

Cooperative advertising in local newspapers appears weekly. The dealer receives merchandising assistance such as bulletins, display service, folders, and other sales help.

Regular bulletins cover such subjects as sales promotion, purchasing, store management, and advertising.

There are now approximately 55 stores engaged in this cooperative movement, all of whom are located in the Metropolitan area of New York.

Mr. Ben Lehr, of Lehr Auto Supply Co., New York addressed the first meeting giving a resume of plans for winter selling. Regular meetings are held every month.

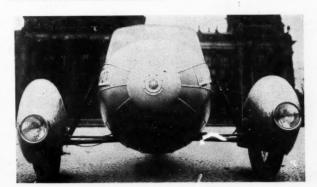
Winfield Water-Proofing Fluid Aids Wet Starting

Immediate starting of wet motors is said to be possible through the application of Winfield water-proofing fluid. Besides making possible the starting of motors with wet cables, plugs, coils, etc., use of this product will insure protection from moisture for several months after its application, according to the Winfield Carburetor Co., 3057 Treadwell St., Los Angeles, Cal., makers of this fluid.

Mechanical Bumper-Lift Jack

A mechanical bumperlift jack having a capacity of 3000 lb. is now being manufactured by Hein-Werner Motor Parts Corp., Waukesha, Wis. This device hooks under the bumper arm and a rapid ratchet action raises the car. A pivot roller bearing facilitates the correct positioning and operation of the jack. The base and handle are detachable The retail for storage. price is \$2.25 each.

A GERMAN streamline job which it is claimed to be the world's cheapest car to operate. Reports say that it needs $3\frac{1}{2}$ liters of gasoline for 100 kilometers (or about a gallon of gas for 62 miles, believe it or not). Another statement is that the car can reach a speed of 115 kilometers per hour (approximately 71 m.p.h.).



Holmes Form Fitting Creepers Aid Mechanics

The Holmes heavy-duty creepers are made in both solid and ventilated types and are furnished with either standard or heavy duty casters. The patented holders are said to prevent



the casters from working loose, yet permit quick and easy replacement if necessary. The solid creeper is made of one piece heavy sheet steel with all edges folded around a one piece steel frame, giving ample strength to withstand hard service. The frame of the ventilated creeper is made of one piece angle, bent into rectangular shape with the two ends welded together. Slots are punched in the frame to receive flexible steel strips, the ends of which are folded back and electrically welded to the strips themselves.

An exclusive feature claimed by the Ernest Holmes Company of Chattanooga, Tenn., for these creepers is the form fitting design, which makes them comfortable for the mechanic and at the same time provides maximum clearance under the car.

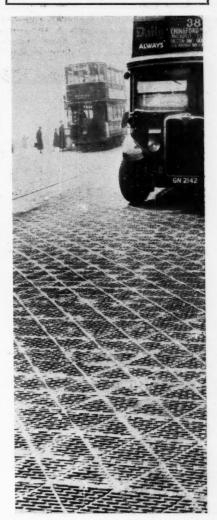
New Sectional Piston Ring Manufactured by Old Gold

The Old Gold Piston Ring Co. of Toledo, Ohio, has developed a sectional type piston ring using a full width genuine Swedish steel ex-



pander. The ring sections, which are all identical, are made of "Aroloy," claimed to be an unbreakable and almost frictionless metal. The expander ends bear against the inside of the ring, rather than against the piston. This ring will function perfectly in oversize cylinders, and according to the manufacturer will seal against oil pumping and compression loss.

Corrugated Paving



A new non-skid paving, expected to "wear like iron" is being tested by London traffic authorities. Photo shows a section of the street in Islington Borough, London, Eng., whereon corrugated iron street paving has been laid. The corrugations are designed much after the style of automobile tire treads. This is expected to reduce skidding to a minimum and at the same time present a road surface of great durability.

U-Type Magnet Used on Tasco Generator Cut-out

The Tasco super "Custom-Bilt" generator cut-out employs a horseshoe or U-type magnet, and because of the close magnetic paths a strong pull is obtained. The voltage coil is of the layer wound type which is said to afford protection against short circuiting. A double primary winding having sufficient carrying capacity for the higher charging rates is employed. Large size contacts of special silver alloy having a low resistance are used to provide a free passage of current. The Tasco cut-out, made by the Automotive Specialty Corp., 382 Jefferson Street, Brooklyn, N. Y., is furnished for either 6 or 12 volts.

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Trucks at War Front

A fleet of motor trucks, reported to be 100 in number, are used to transport Ethiopian recruits to the southern war front close by the Italian Somaliland border. Photo shows trucks loaded with many tribal recruits who answered the recent general mobilization call of Emperor Haile Selassic.



Air-Conditioning Available for Motor Vehicles

An air-conditioning system for motor buses (which can be used also on motor ambulances, private automobiles, etc.) has been developed jointly by the Carrier Engineering Corporation of Newark, N. J., and the Houde Engineering Corporation of Buffalo, N. Y.

The system is designed to circulate through the bus body, air that has been cooled, dehumidified, and cleaned of impurities, in such a way as to assure a maximum of comfort to passengers

Referring to the accompanying illustration, the system includes a cooling unit B with coil, mounted under the roof of the bus, air being drawn over the cooling coil by a motor-driven fan C and forced through a duct D extending the length of the body and provided with outlets along its length. Provision can be made for control at individual outlets. There are two air inlets to the cooling unit, one admitting air from the inside of the bus, the

other from the outside, and the two are so proportioned that approximately 25 per cent of the air is taken from the outside. This air from the outside is taken in through a filtering element.

The refrigerant used in this system, known as Carrene, is claimed to be safe under all conditions, being non-poisonous, non-asphyxiating and non-inflammable, and it has fire-extinguishing properties. The amount required for a bus cooling system is said to be about one gallon, and the rate of loss practically negligible.

Refrigerant enters the cooling coil in the liquid state; it evaporates in the coil, and the heat required to effect vaporization is withdrawn from the air passing through the cooling unit, which is the source of the refrigerating effect. One element of the system is a low-pressure compressor A, which supplies refrigerant to the cooling unit B. It is installed under the hood and is driven directly from the bus engine.

Before reaching the cooling unit, the refrigerant first passes through the condenser E, where it is cooled by the air stream.

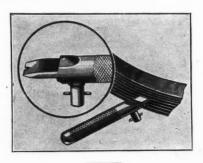


Maintenance men will be interested to know that the Raybestos Division of Raybestos-Manhattan, Inc., Bridgeport, Conn., is featuring its air-liner combination which includes a pneumatic riveter, carboloy countersinks and the No. 825 brake lining grinder. The riveting machine operates on 80 to 100 lbs. air pressure, and a light touch of the foot treadle puts into action a predetermined force with constant riveting pressure at every portion of the stroke. The carboloytipped countersink is said to give exceptionally long life even heavy brake linings. The brake lining grinder, illustrated, will handle all sizes of shoes up to six inches in width, such as are used on trucks.



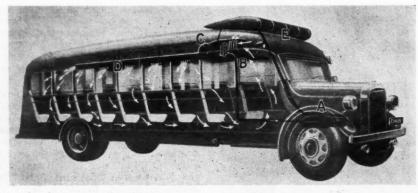
Hot-Shot Grease Tool Injects Grease in Springs

The Hot-Shot grease tool can be attached to the conventional grease gun for injecting grease between the spring leaves. The tapered end which is driven between the leaves contains a small hole through which the grease is fed. This tool is a recent product of the National Machine & Tool Co., Jackson, Mich.



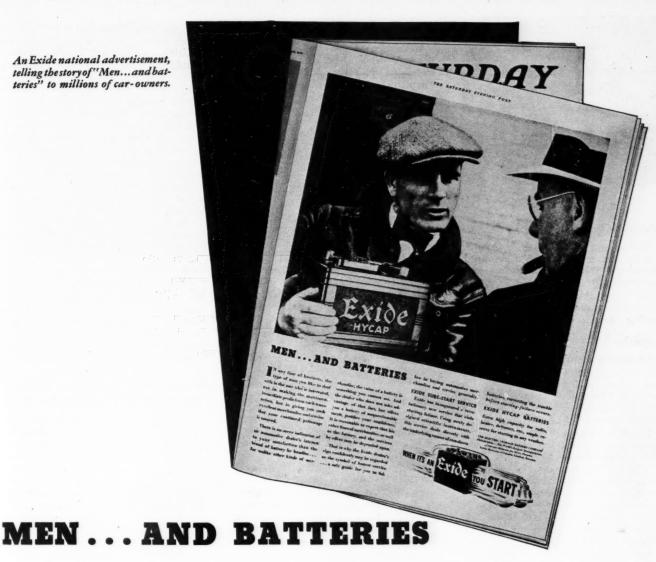
Miller Makes 'Wonder Weld' To Repair Engine Cracks

The Miller Mfg. Co., 1100 Mt. Ephraim Ave., Camden, N. J., are marketing Wonder Weld for repairing cracked valve ports, water jackets and cylinder heads. It is introduced into the radiator after the water is warm, and the sealing of the cracks takes place when this liquid seeps through and comes in contact with the hot metal. Wonder Weld will not clog the radiator or cooling system, according to the maker.



Air-conditioning system installed in a bus

An Exide national advertisement, telling the story of "Men ... and batteries" to millions of car-owners.



Look at the above illustration. It shows an unusual advertisement appearing in the November 23rd issue of The Saturday Evening Post—a message to the public about the Exide dealer organization. It tells car-owners why it pays to go to an Exide dealer, not only for batteries and battery service, but for automotive merchandise and service generally.

We have faith in our dealers because we know what kind of men they are. They are selected on the basis of their experience and sound business sense, and they have forged ahead by selling excellent merchandise and delivering honest service. The Exide franchise is always open to dealers of that caliber.

It is only natural that we should support such dealers to the limit. That is one of the many reasons why you hear this phrase so often-"It's good to be an Exide dealer."

EXIDE SURE-START SERVICE

The alert, progressive dealer has an unequalled opportunity to increase not only his battery sales, but his sales of oil, cables, spark-plugs, gas, etc., by becoming an Exide Sure-Start Dealer. See your Exide wholesaler today, or write direct to us.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia The World's Largest Manufacturers of Storage Batteries for Every Purpose Exide Batteries of Canada, Limited, Toronto

EXIDE HYCAP

A new line of extra high capacity batteries with ample power for heater, radio, defrost-er, lights and other accessories, and plenty of reserve for "touch and go" starts in any weather.



WHEN IT'S AN EXIDE



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is



"Pedrick" and "Wilco"

The name "Pedrick" now applies only to piston rings. All other products of the Wilkening Manufacturing Co., Phila., Pa., considered as accessories to the Pedrick line, will be sold under the trade name "Wilco," according to recent announcement.

Permite

Aluminum Industries, Inc., Cincinnati, Ohio, makers of Permite aluminum alloy pistons, purchased the assets of The Dall Manufacturing Co., Inc., Cleveland, Ohio, cast iron piston manufacturers, it has been announced. ... Dall becomes a division of Aluminum Industries, making cast iron pistons at Cleveland. Aluminum alloy pistons will be produced at Cincinnati. . . . Permite also made known the removal of its Chicago warehouse branch from the Warehousing Service Co. to its own warehouse, 18 E. 25th St. A. F. Abele is manager. . . . E. J. McDermott, Dallas, Tex., has been named district manager in the Southwestern territory for Aluminum Industries, Inc.

Prest-O-Lite

That company announced that its shipments of replacement batteries during October were the largest of any month in the company's history.

Kellogg

Incorporated under the laws of the State of New York recently was the Kellogg Compressor & Manufacturing Corp., to take over all assets of the Kellogg Manufacturing Co. J. F. "Sam" Weller has been named president of the new corporation. Associated with him are John J. Sharp, H. Ozgood Holland, George B. Collins, Nicholas Arnold and Dan Bohannon, A new line of air compressors has been announced.

Johns-Manville

Stimulation of industry and trade through reduction in governmental expenditures and a decrease in taxes was demanded by Lewis H. Brown, president of Johns-Manville, in a speech before the American Bankers' Assn. in New Orleans recently. Johns-Manville and the L. H. Gilmer Co., Phila., have signed a contract whereby the Johns-Manville Sales Corp. of New York will be the sole sales agents in U. S. and Canada for the Gilmer company's automotive products.

Firestone

Firestone Tire & Rubber reported net sales of \$121,670,572 and net profit of \$5,649,145 for the fiscal year ended Oct. 31.

Grey-Rock

The United States Asbestos Division of Raybestos-Manhattan, Inc., Manheim, Pa., have announced the opening of a warehouse in Cleveland, with the Manufacturer's Warehouse Co., 1250 Ontario St.

Other Events

Bakelite Corp. celebrates its twentyfifth anniversary, commemorating the occasion with a forty-eight page jubilee edition of the "Bakelite Review"... I. W. "Bob" Godfrey, formerly with P & D Manufacturing Co., has joined P. Sorensen Manufacturing Co. of Long Island City, N. Y. . . . A new addition just being completed will double the size of the Sunnen factory at St. Louis . . . F. W. Bowers has been made plant manager of the Young Radiator Co., Racine, Wis. . . . An additional machine shop building is being planned for the Buffalo, N. Y. Works of Worthington Pump and Machinery Corp. . . . Globe-Union Mfg. Co. has decided to build two new factories, one of which is to be located in Texas. Other location not named, as yet . . . Van Auken-Ragland, Inc., Chicago advertising agency, is handling the sales promotion for Shay Products Corp., makers of Crumbliss Auto Coils and Condensers.

New Catalogs

Langsenkamp - Linkert Carburetor Co. of Indianapolis, Ind., has just issued its new Replacement Parts Catalog . . . Modine Manufacturing Co., Racine, Wis., makers of direct-suspension type unit heaters has also released a new catalog of unit heaters.

Winx, New Tung-Sol Bulb, Blinks 180 Flashes Per Min.



Winx is the name of the new bulb for stop and signal lamps which constantly blinks while in operation, giving 180 flashes per minute. The operating mechanism which is contained in a small collar at the base of the bulb is said to

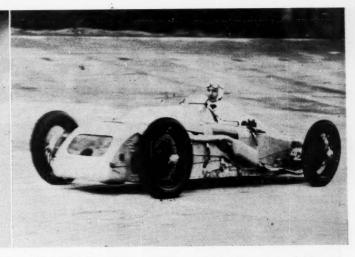
be of very simple construction, and does not interfere with the insertion or withdrawal of the bulb from a standard socket. Winx, which is a product of the Tung-Sol Lamp Works, Inc., 95 Eighth Ave., Newark, N. J., is claimed to be positive in operation, and to use less current.





A 1904 Brush (left) claimed to be the oldest automobile now in operation. J. L. Wilson of Ellensburg, Wash., is its owner. The car is said to have operated continuously for thirty-one years. (Right) A front wheel drive. Jimmie Lynch, of Texarkana, Tex., who drives his car from the saddle in the manner shown, with no outside or inside assistance.





A WINDOW display (left) set up at the Ford Exposition Building, San Diego, Calif., suggests some very good ideas for window decorating applicable to the independent repair shop as well. (Right) Reginald Munday, English speedster, in a recent attempt to establish new class records for 3-liter Diesel engine jobs.

How To Cure "Clicking" Chevrolet Drive Pinion

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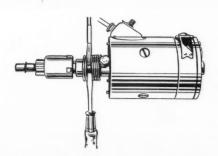
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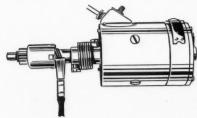
The Chevrolet Motor Company advises that the "clicking" noise heard upon the demesh of the Bendix drive pinion as used on the 1935 models may be remedied by proper lubrication. To lubricate, proceed as follows:

1. Remove Bendix drive housing from starter motor.

2. Spread leaves of drive spring with screw driver, and with a small brush apply a special graphite lubricant to both sides of fiber washer located in recess between back end of screw shaft and shoulder of drive head. Fig. 1.



3. Screw pinion and barrel assembly forward on screw shaft to full extent of travel and apply a light application of the special graphite lubricant to exposed triple threads. Fig. 2.



4. Work pinion and barrel assembly backward and forward a few times to carry lubricant along entire length of threads and to front thrust washer surfaces.

5. Replace Bendix drive housing on starter motor making sure spacing washer is in place on armature shaft between Bendix pinion and drive housing bearing.

Fender Guide and Wiper Blade Among Hackett Line



The new Hackett 7 ply rubber windshield wiper blade rolls in action, so there is no bending of the rubber, resulting in long life. It is equipped with a universal spring clip which is adaptable to all types of arms. The blade shell is made of chrome-plated brass in 71/4, 8 and 9-in. lengths.

Another new device of Hackett Products Co., Inc., Providence, R. I., is a combination parking and fender guide fastened to the bumper. Of adjustable height to fit different cars, it retails for \$3.75.

Federal-Mogul Markets Out-of-Round Indicator

The Federal-Mogul Corp., Detroit, Mich., has placed on the market an out-of-round connecting rod indicator that reveals any harmful bearing conditions that may exist in connecting rods using insert type bearings. Measurements are taken between two fixed, hardened, ballpointed pins and one movable pin. This threepoint contact makes the indicator self-cen-



tering. Bores ranging in size from 1½ to 3½ in. can be checked, although it is also possible to measure holes as small as % in. diameter.

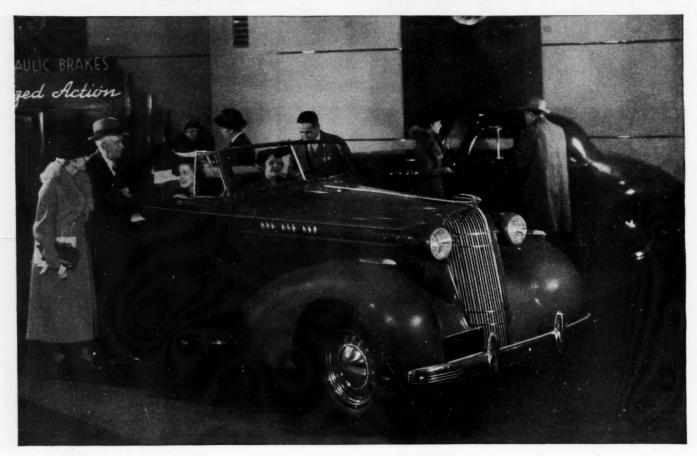
Single Cells and Entire Battery Tested On GE Tungar Photometric Battery Tester

The new GE battery tester performs a dual function by showing the over-all capacity of the battery, and at the same time indicating the state of charge of the individual cells. It is built on a new principle that utilizes the photometric system of measuring cell condition by the photo-test

The condition of each individual cell is displayed upon a screen in the form of a miniature battery illuminated from behind by three sensitive lamps. Variations of a fifth of a volt between cells make a visible difference in the intensity of illumination. A shorted or worn out cell gives one light field much darker than the other

The General Electric Co., Bridgeport, Conn., makers of this tester, have endeavored to make its findings easily understandable by marking the capacity meter: Good, Fair and Replace. Since this test is made under a high rate discharge, it shows the mechanic at a glance whether the battery is serviceable.

The Hit OF



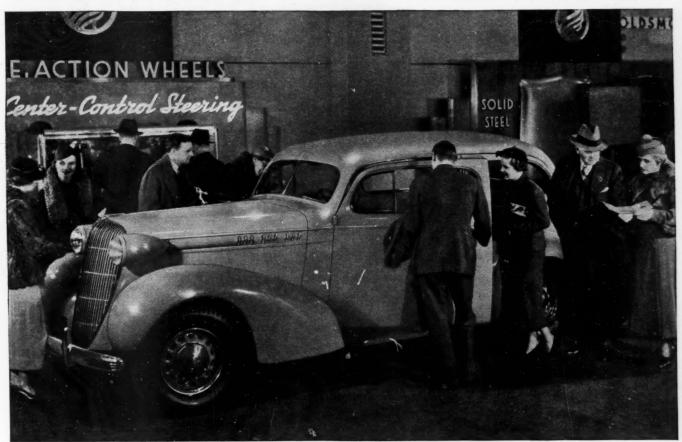
"THE CAR THAT HAS

Everything"

Including One of the Most Profitable Franchises in the Industry Today!

1936 OLD

ALL THE SHOWS!



AT THE Automobile Shows all over the country, enthusiastic crowds are paying tribute to the new 1936 Oldsmobile. And they are saying it with actual orders! This public reception indicates that Oldsmobile and Oldsmobile Dealers will go into 1936 in the strongest profit position in their history.

It is profitable to sell a car with the public acceptance Oldsmobile is enjoying—for several reasons:

- 1. Lower Selling Expense: Sales do not have to be forced or bought at high cost. They come naturally, in response to normal business effort.
- 2. Better Used Car Condition: Oldsmobile new cars are in great demand, and better trades result.
- 3. Less Policy Expense: Because of its satisfactory operation in the hands of owners, Oldsmobile requires the very minimum of policy adjustments.
- 4. Owner Loyalty: Because Oldsmobile owner loyalty is as high as any in the industry, Oldsmobile

Dealers are not only able to get more repeat sales but they also get the benefit of recommendations from Oldsmobile owners to their friends.

In addition to the popularity of Oldsmobile is the important fact that Oldsmobile is equipped by enlarged plants and greater production facilities to supply the increased demand.

You may have an opportunity to share in the growing success of Oldsmobile. A few good territories are still open. Why not investigate? Your inquiry will be held in strictest confidence. Address D. E. Ralston, Vice President and General Sales Manager, Olds Motor Works, Lansing, Michigan.

A BIG ROOMY NEW SIX

*665

Base prices, listat Lansing, Mich. Special equipment extra. Car illustrated at left is the Eight-Cylinder Convertible Coupe, \$935 list. Car illustrated at right is the Six-Cylinder 5-Pass. Coupe, \$730 list.

A LUXURIOUS NEW EIGHT

*810

SMOBILE

Toboldt Speaks at Phila. Service Meeting

Trends in motor car design, as evidenced in 1936 models, were described by Bill Toboldt, editor of Motor Age, before a gathering of Philadelphia Automotive Service Assn. members last month.

The meeting was in the nature of a Thanksgiving get-together, with some of the charter A. S. A. members enrolled in 1922 present for the affair. Several new members also were introduced by William P. Berrien. Another feature of the evening was the presentation by E. Van Lier, service engineer of United Motors Service, Inc., of two timely servicing devices. One is known as "the mechanical commentator" and the other a new headlight testing device.

Fred C. Nicholson, president, announced that the annual Christmas frolic of the association will be held Monday evening, Dec. 16.

Steel-Vent Is New Hastings Oil Ring

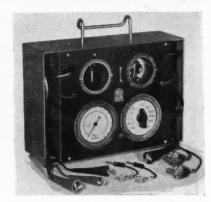
The Hastings Mfg. Co., Hastings, Mich., has just announced a new oil control ring, known as Steel-Vent. This ring consists of four pieces,



two steel segments, a ventilating spacer and an expander of spring steel which fits back of the assembly. These steel segments, which are of special alloy wear-resisting steel, work independently of each other and are said to conform to the cylinder wall regardless of taper. Quick seating is obtained through accurate machining of the contact surfaces. The maker states that only one ring per piston is required to effectively stop oil pumping, the ring being installed in the bottom oil groove.

Niehoff Develops New Portable Ignition Tester

The model T-200 Niehoff ignition tester is a portable outfit for testing coils, condensers, plugs, distributor caps and rotors, either on or off the car. In making tests on a car no external source of power is needed to operate the tester, as it can be hooked to the car battery. For testing the



coil an adjustable spark gap is used, which is graduated in millimeters and controlled by a vernier knob with a 10-to-1 ratio. A Geissler tube indicates any "miss" in the spark. The breaker points are operated by a variable speed motor. This equipment is a recent product of C. E. Niehoff & Co., 230 West Superior Street, Chicago, Ill.

Delco-Remy Announces Two New Klaxon Twins

Two new pairs of matched horns have been announced by Delco-Remy Corp., Anderson, Ind. They are electrically operated and air columns in the base produce the characteristic



Klaxon blended tone. The 33-F horns are finished in polished chromium for outside mounting, while the 33-S horns have a baked enamel finish for mounting under the hood.

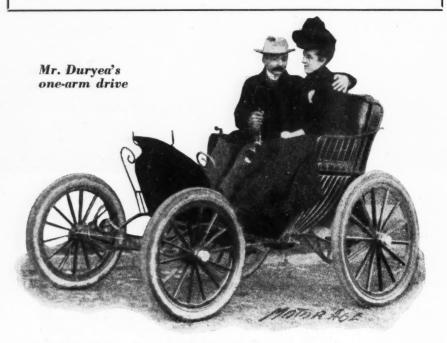
Weed Tire Chain Pliers

The American Chain Co., Bridgeport, Conn., are marketing the Weed Pliers, which have been redesigned



with heavier and longer handles to make the replacement of cross chains on the Weed tire chains easier and quicker. They are priced at \$1.00 each.

Thirty-five Years Ago In Motor Age



One-arm driving was a "selling point" for the smart new 1900 Duryea job. "The accompanying illustration explains itself," wrote C. E. Duryea, in the Dec. 13, 1900, issue of Motor AGE. "It is intended to relieve the motor vehicle industry of that feeling of disfavor in which it has been held by certain persons—according to the jokers, at least. These vehicles can easily be controlled by the outside hand, as shown..."

Jim Jeffries, heavyweight champ 'way back in 1900, was reported as "the latest advocate of the motor vehicle."

The outlook for the independent repairman was bright, even as early as December, 1900, for Motor Age reported:

"Automobilers will surely not lack any more conveniences on every hand for storage, power supply and repair. The independent storage and repair stations have proved handsomely paying investments and more of them are in contemplation on even a larger and more elaborate scale." In New York the story pointed out, "the chauffeur in need or distress has now not more than a block or two to go to reach a supply port or haven of refuge." So that's what they called you fellows, "a haven of refuge"-oh, well.

You'll make more, servicing with STROMBERG

Factory-Rebuilt Exchange

CARBURETORS



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Visit the Bendix Exhibit at the Automotive Service Industries Show — Atlantic City, December 9th to 13th.

more money . . . more friends more headway in business

STROMBERG has introduced the sensible way to service carburetors. Hundreds of shop and service station operators, all over America, have lined up back of it, and found it pays in every way.

Low prices make these guaranteed factory-rebuilt Stromberg Exchange Carburetors a very attractive "buy" for the car owner. There's little or no labor investment, exacting service work is avoided, stock investment may be very small, and customer satisfaction is certain.

Send the coupon below for the "Make-and-Model" sheets and full details.

BENDIX PRODUCTS CORPORATION 401 Bendix Drive, Dept. 11, South Bend, Indiana Send me full details about your new Stromberg Carburetor Rebuilding Proposition.
Name
Address
CityState
Nature of Business



Courtesy, The Philadelphia Inquirer

Two-in-One Timing Gage Developed by Kreiszl

Paul Kreiszl, 212 Broad St., Newark, N. J., has developed a combination ignition timing gage and compression recorder which gives a dial reading of ignition timing with the motor running. Every line on the dial indicates 2 deg. on the flywheel, and also 2 lb. compression. To op-erate remove one of the spark plugs and insert the gage, attaching the spark plug lead to the gage clip. If the motor is idled as slowly as possible the white pointer will synchronize with the piston travel, and a flash will indicate the exact point of ignition. By advancing or retarding the distributor the spark can be set to occur at the correct number of degrees before dead center. The recorder pointer shows and holds the compression reading.



The Auto Show Patron Is Displaying More Caution . . .

Air-Lec Door Operator Works From Shop Air Line

Air-Lec is the door operator, which uses the regular shop air line for automatic opening and closing of the doors. No motors or other outside power equipment are needed. This device start is controlled by switches, which can be placed at convenient points in the shop or office. A new



double check brings the heaviest door to a smooth stop without slamming, and provision is made for stopping the door in case it strikes any obstruction while closing. The Air-Lec operator does not interfere in any way with the manual closing or opening of the doors. This unit is made to fit the conventional swinging, folding or sliding type door and is easy to install. It is made by Schoelkopf Mfg. Co., 210-218 East Washington Ave., Madison, Wis.

Fostoria Titeseal Prevents Rust, Seals Joints, Lubricates

Among the new products is Fostoria Titeseal, furnished in three types, light, medium and heavy weight. The light weight material is intended primarily to seal gasoline line joints, to prevent rust and corrosion on threads, nuts, battery terminals, etc., and to lubricate springs and auto body parts. The medium weight is claimed to be a flexible, non-hardening, leak-proof seal for general gasket application. As a sealing compound for automobile tops, the heavy weight is recommended. This latter type is also useful in connection with general tightening jobs, as it prevents noise and squeaks between wood joints and metal fittings.

Titeseal is put up in tubes and cans, the latter retailing for \$1.60 in the 1 lb. size. It is a product of The Fostoria Pressed Steel Corp., Fostoria, Ohio.

Oil Temperature Regulator for Chevrolet Cars and Trucks

The accessory department of Chevrolet Motor Co. has released an Oil Temperature Regulator, part No. 601754, for installation on all 1935 Chevrolet passenger cars and trucks. This regulator, through which flows lubricating oil from the crankcase and water from the radiator at right angles to each other, tends to equalize the water and oil temperatures to within 15 to 20 deg.

In cold weather, the regulator functions so that the temperature of the oil is raised in approximately the same time as it takes the water temperature to rise. In warm weather, the regulator utilizes the water in the cooling system to lower the oil temperature which maintains the viscosity of the oil in the crankcase and greatly improves the lubricating efficiency of the oil even at sustained high car speeds.

Pete McCannic



Makes A Swell Impression





From these Jobbers... Parts of Genuine Quality for Every Car

The National Automotive Parts Association distributes only branded lines of standard quality.

All NAPA lines are required to equal, or surpass, in quality, the parts they replace.

NAPA has consistently opposed and refused to distribute sub-standard parts—believing this policy to be in the best interests of the car owner, and the service trade.

Any part approved by NA PA may be purchased with complete assurance of its genuine quality.

* * *

THROUGH the fat years and the lean years alike, there has been one unfailing source for the parts you need in servicing automobiles.

No matter what make of car—what year—what model—the automotive wholesaler has the needed part ready for you—or makes it the first order of business to get it for you.

The automotive jobber is your partner in this

business of keeping the nation's cars on the road.

For more than ten years, NAPA has been assisting representative automotive jobbers to give you quicker, more complete and more dependable service on automotive parts. NAPA is a nation-wide warehousing and distributing organization which maintains, in 38 warehouses, the equivalent of factory stocks of forty non-competing automotive lines. From these warehouses, NAPA sells and distributes these lines to automotive jobbers.

Today more than 1400 jobbers are using NAPA as a source of supply. There is an NAPA jobber near you who offers you actual and tangible advantages in the assurance of quality, and in completeness and promptness of service. You make these advantages your own by buying regularly from the NAPA jobber.

This message is one of a series designed to give a better understanding of the way NAPA jobber service can be helpful to you.

NATIONAL AUTOMOTIVE PARTS ASSOCIATION . Executive Offices, Fox Building, Detroit

N-A-P-A

NATIONAL AUTOMOTIVE PARTS ASSOCIATION

A NATION-WIDE WAREHOUSING AND DISTRIBUTING ORGANIZATION

Brown & Sharpe Redesign No. 11 Micrometer Caliper

The No. 11 Brown & Sharpe micrometer has been redesigned, and the frame is now the C type, I section. The anvil projects 3/16 in. which makes it convenient for measuring keyways, counterbores, etc. The graduations on the barrel are made alternately long and short to facilitate



reading, and the figures on the thimble have been increased in size. This tool is now furnished with an adjustable thimble. The nut through which the micrometer screw passes is integral with the barrel, providing added strength and rigidity. This tool is a product of the Brown & Sharpe Mfg. Co. of Providence, R. I., and retails for \$6.75.

1936 Autos 23 ϕ per Lb. 1925 Cars 41 ϕ per Lb.

If cars were bought by the pound, the new car customer would pay 23 cents per pound for his 1936 automobile, in comparison with cars made and sold ten years ago, according to the experts on the staff of the Automobile Manufacturers Assn. This represents a reduction in cost of 44 per cent, the report states.

In the same analysis, the cost per horsepower is \$7.80 per "horse" in the 1936 automobile, as against \$31.50 per horsepower on the 1925 car. These figures show an increase in value but a startling decrease of 75 per cent in cost per horsepower.

In an effort to present the striking increase in value of the car buyer's dollar, by virtue of changes in modern automobiles, the A.M.A. made a study of horsepower, weight and wheelbases per dollar-value.

Taking inches of wheelbase as a standard, the statisticians showed that the average price of automobile transportation on the 1925 car was \$9.60 per wheelbase inch, while today it is \$5.90 per inch. A decrease in cost of 39 per cent.

Kris Kringle's Production Line



Santa Claus insists that December 25, 1935, will be AN AUTOMOTIVE CHRISTMAS. Look at his production line . . . These toy cars have been rolling along at a high rate since last summer. But that reminds us, there are plenty of extra dollars loosened around Christmas, some of which will go into engine tune-up, winter preparedness, extra accessories and the like. Go after your share of Christmas business, so that yours will be a Merry One.

Ted Allen on the Mend

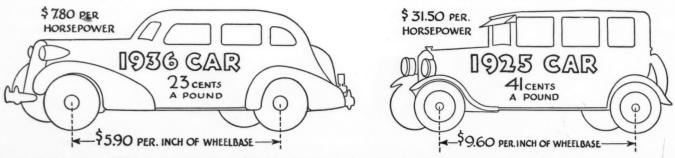
Ted Allen, secretary of the A. A. A. Contest Board, and a leading light in national automobile racing, is steadily recovering from the emergency operation he underwent two months ago. He is expected back at his Washington, D. C., office soon.

New Unit Added to King System of Engine Tune-Up

The Electric Heat Control Co., 9115 Inman Ave., Cleveland, Ohio, has added a new unit to the King system of motor tune-up. The type MT-210 tester will make a complete motor test including cylinder compression, ignition, coils, condensers, generators, starters, spark plugs, cut-outs, relays, etc. Particular attention has been paid to the lighting of the panel,

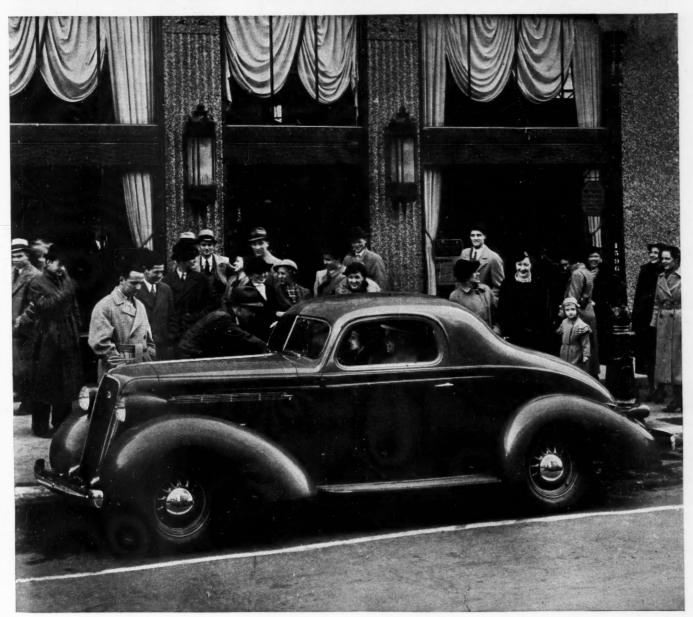


a tubular bulb in a chrome reflector effectively lighting all the instruments.



Comparing 1936 cars with those of 1925, in a measure of cost per pound per horsepower and per inch of wheelbase.

WATCH STUDEBAKER!



The new 1936 Studebaker Dictator (illustrated above) at \$665 is the car America ordered at a price anyone can afford to pay. The President, 115 horsepower, 125" wheelbase, at \$965, is priced as much as \$300 below the 1935 President. Exclusive territory. A dealer-built franchise. Write me in confidence.

PRESIDENT

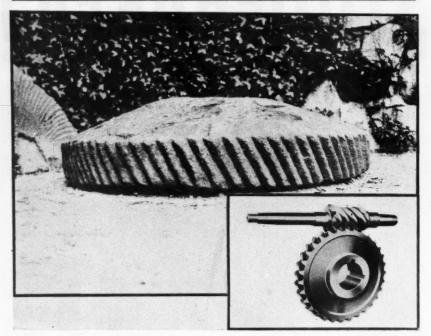
THE STUDEBAKER CORPORATION

One of America's leading financial services reports to its clients in part as follows concerning the New York Automobile Show:

"Our award for the greatest relative improvement (1936 cars over 1935) goes to Studebaker and Both of these cars have plenty of 'IT'. Our award for the best looking cars at the show goes to them.

"Predictions for 1936. Motor output will increase at least 20 percent over 1935. Studebaker to show the largest percentage gains (over 100%). More than one-half of the total increase in 1936 sales will accrue to the low medium priced group (\$600 to \$1,000)."

Helical Gears in the Stone Age



A helical gear cut out of solid stone, some eight or nine centuries ago and bearing a striking resemblance to present-day helical gears, has been discovered in the ruins of an old castle in Sweden by Otto Lundell, President, Michigan Tool Company, Detroit, producers of gear manufacturing equipment.

New I.G.M.A. Organization Plan Becomes Effective

The International Garage & Maintenance Association, national organization representing the garage and maintenance trade has announced a change of organization plan now in effect.

This plan established 13 Zones in the United States. State Councils, or committees, composed of six members each are now being appointed, making it possible, where desirable, to have three representing parking garages and three representing maintenance. This is optional with each state.

Zone Councils are composed of the members of each State Council.

Each Zone Council elects two of its members to serve on the national Executive Council.

The Officers of the association—President, five Vice-Presidents, Secretary, Treasurer, the two members from each Zone, an associate member representing manufacturers and an associate member representing jobbers, constitute the I.G. & M.A. Executive Council which, together with the Chairman of the Executive Council, makes a total of 37 members as the official governing personnel.

Council (State and Zone) members are elected by I. G. & M. S. members within each state. This assures a representative Executive Council or board. The Chairmen of State Councils automatically become members of Zone Councils.

General Purpose Drum Lathe And Grinder Made by Riess

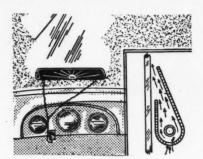
With the general purpose drum lathe and grinder, manufactured by the Riess Manufacturing Co., 315 S. Union St., Kokomo, Ind., it is not necessary to remove the wheel from the brake drum for turning or grinding. Four feeds and four speeds are provided, the latter being 15, 30, 60 and 120 r.p.m. This machine can be used as a lathe for cutting the teeth off flywheels preparatory to shrinking on ring gears, for turning pistons and armatures and for general lathe work.

McKay Tire Chains Have Double Reinforcing Bars

McKay tire chains are now being furnished with multi-grip double reinforcing bars which are set at an angle to the path of travel, and thus present sharp corners and edges in four different directions. double reinforcing bars project above the level of the cross chain links which is said to be a great aid in preventing side skid and giving positive traction. The bars are electrically welded to the tread links of the cross chains. The Kip-Lock chain fastener is enameled, making it easy to locate, and the size of the tire chain is stamped on the fastener. The McKay Company, Pittsburgh, Pa., is also continuing its line of rubber chains with several improvements.

Sunburst Defroster Is Like Warm Air Furnace

The No. 138 Sunburst Defroster, manufactured by H. E. Williams Products Co., Carthage, Mo., is said to be a miniature warm air furnace. Cool air flows in through holes at the bottom, is heated, and then rises in a warm blanket against the inner face of the windshield. The nichrome



heating element is shielded to prevent breakage. A clamp-on plug-in socket is furnished to be mounted on the dash.

Brake Tests Recorded On New Decelerometer

The Friedli-Feragen decelerometer records a 20 mile an hour stop even though the car may actually be travel-



at the moment the brakes are aping slower or faster than that speed plied. Its action is automatic and two readings are made of every stop, one recorded on a certificate and the other on the scale that is on top of the instrument. In operation the instrument is clamped to the left running board, the car is brought up to speed, and stopped as quickly as possible, using the foot brakes. This device is easily portable, its dimensions being 6 x 4 x 7 in. and weight 14 lb. It is manufactured by the Bendix Products Corp., South Bend, Ind.

Yes Sir!

You'll find more news and more descriptions of new products in the back part of this issue of Motor Age.

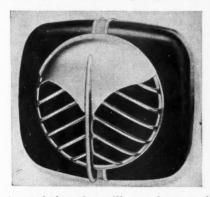
Death Valley Scotty



"Death Valley Scotty," who lives in a castle in the heart of Death Valley and reputed to be very wealthy, drives an old, rebuilt Franklin. While in Los Angeles recently he is reported to have said, "These city trails ain't no place for this locomotive. It's a specially made model for traversing the desert mountains into the Valley. It goes 700 miles without stopping. Got a 100-gallon gas tank and carry ten gallons of oil.

Directional Heat Control Features Perfex Heaters

The Perfex Radiator Co., Milwaukee, Wis., is introducing a new automobile heater with a lustre black finish and chromium grille, so con-



structed that the grille can be turned to the right or left to direct the heat as desired. This heater has drawn brass tanks and copper water channels. The variable speed 6 volt motor is controlled by a rheostat switch mounted on the dash. Retail price, \$15.50.

Modernization Plan Under Way

The Prospect Garage, West Hartford, Conn., is undergoing a program of alterations which includes installation of an asphalt tile floor, construction of show windows and addition of showroom facilities. The heating plant is also being modernized.

Pyrene Now Making Bar-Reinforced Chains

More than double mileage and improved anti-skid traction are claimed for the "Doubleduty" bar-reinforced tire chains now being produced by the Pyrene Manufacturing Co., Newark, N. J. The case-hardened reinforcing bar welded across each link provides two thicknesses of metal where there is but one on a regular chain. These chains have the patented easy-on-easy-off lock that is said to snap tight, hold firmly, and yet open automatically without tools when the tension is re-



lieved. Parkerizing renders these chains rustproof. The cross links are black and the welded side chains have a silveroid finish. Pyrene chains are available in a complete range of sizes, including emergency units.



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Mechanical Specifications

These Specifications Are Brought Up-to-Date Each Month by the

				· ENGINE											CHASSIS								
						_	a;		erial	ke						Make		Clutch					
MAKE AND MODEL	Lowest Priced Sedan	Wheelbase (Ins.)	Tire Size (Ins.)	No. of Cylinders, Bore and Stroke	Taxable H.P.	Piston Displacement (Cu. Ins.)	Maximum Brake H.P. at Specified R.P.M.	Compression Ratio (to-1.)	Cylinder Head Material	Camshaft Drive Make	Piston Material	Oil Cleaner Make	Air Cleaner Make	Carburetor Make	Muffler Make	Electrical System N	Battery Make	Type and Make	Gearset Make	Universals Type and Make	Rear Axle Type and Make	Service Brake Type and Make	
Auburn654	\$ 795	120	6.00/16	6-31/6x43/4	22.5	209.9	85-3500	6.20	A1	Whit.	A1	Pur	AC	Str	Buf	A	USL.	P.Long.	wg	Nb-Mec.	⅓ Col	вн	F
Auburn	1095	127	6.50/16	8-31/6x43/4	30.0	279.9	115-3600	6.50	Al	Whit.	Al	Pur	AC	Str	Buf	A	USL.	P.Long	Det	Nb-Mec.	1/2 Col	ВН	F
AuburnSC852	1545	127	7.00/16	8-31/x43/4	30.0	279.9	150-4000	6.50	Al	Whit.	Al	Pur	AC	Str	Buf	A	USL.	P.Long	Det	Nb-Mec.	⅓ Col	ВН	F
Austin		75	3.75/18	4-2.2x3	7.8	45.6	13-3200	5.30		Spir	Al	No	No	Til		A	USL.	P	WG	F-Spi	1/2 Sal	М	C
Buick	1090 1255		6.50/16 7.00/15 7.00/16 7.50/16	8-3\frac{3}{16}x3\frac{7}{8} 8-3\frac{7}{16}x4\frac{5}{16} 8-3\frac{7}{16}x4\frac{5}{16} 8-3\frac{7}{16}x4\frac{5}{16}	37.8 37.8	$\begin{vmatrix} 320.2 \\ 320.2 \end{vmatrix}$	120-320 120-320	5.45 5.45	CI.	LB	Ala	AC	AC	Str Str Str	Wal Wal Wal	D	Del	P.Long	Own.	m-Spi	1/2 Own 1/2 Own 1/2 Own 1/2 Own	BH	70707070
CadillacV8-60 CadillacV8-70 & 75 CadillacV12-80 & 85 CadillacV16-90	2445 3145	131–38 131–38	7.00/16 7.50/16 7.50/16 7.50/17	8-33/6x41/2 8-31/2x41/2 12-31/8x4 16-3x4	36.4 39.2 46.9 57.5	346 368	125-340 135-340 150-360 185-380	6.25	CI.	Mor	Ala	No Han	AC	Str Str DL DL	Old	D	Del	dp.Long. dp.Own	Own.	Nb-Mec. Nb-Mec.	1/2 Own 1/2 Own 1/2 Own 3/4 Own	BH	04 04 04 04
Chevrolet Mas. Con. ChevroletMaster ChevroletStd.		113	5.50/17 5.50/17 5.25/17	6-3%x4 6-3%x4 6-3%x4	26.3	206.8 206.8 206.8	79-320	6.00	CI	Gear.	CI	No	AC.	Car Car	Own.	D	Del Del Del	P.Own	Own.	m-Own	1/2 Own 1/2 Own 1/2 Own	OH.	ı
Chrysler Six Chrysler DeLuxe 8 Chrysler Airflow 8 Chrysler Air. Imp. 8 Cord Six	1345 1475	123 128	6.25/16 6.50/16 7.00/16 7.50/16 6.50/16	6-3%x4½ 8-3¼x4½ 8-3¼x4½ 8-3¼x4½ 8-3½x3¾	33.8 33.8 33.8	273.8 323.5 323.5	105-340 115-340 130-340	$ \begin{array}{c c} 0 & 6.20 \\ 0 & 6.20 \\ 0 & 6.50 \end{array} $	CI°.	Ch Ch	Al Al	Pur Pur Pur	AC AC	B&B Str Str Str	Own.	A A	Wil Wil Wil	P.B&B P.B&B P.B&B P.B&B P.Long	Own.	Nb-UP	1/2 Own 1/2 Own 1/2 Own	LH.	
De SotoAirstream 6 De SotoAirflow 6 DodgeSix DuesenbergJ	1095 695	118 115½ 116 142–153½	6.25/16 6.50/16 6.00/16 7.00/19°	6-33/8x41/2 6-33/8x41/2 6-31/4x43/2 8-33/4x43/2	27.3 25.3	241.5 217.8	100-340 87-360	06.50	Al.	Ch	Ala	Pur	AC	B&B	Own.	A	Wil Wil	P.B&B P.B&B P.B&B dp.Long.	Own.	Nb-UP	1/2 Own 1/2 Own 1/2 Own 1/2 Own 1/2 Own	LH	
FordV8	520	112	6.00/16	8-31/6x33/4	30.0	221.0	85-380	0 6.30	Al.	Dia.	A1	No	AC	Str	Own.	0	Own.	P.Own	Own.	m-Own	3/4 Own	OM	
Graham6-80 Graham6-90 Graham S. C 6, 110	635 765 865	111 115 115	6.00/16 6.00/16 6.25/16	6-3x4 6-31/4x43/ 6-31/4x43/	25.3	169.6 217.8 217.8	85-330	0 6.70	Al.	LB.	Als.	No	Bur	Mar Mar Mar(s)	Old Old Old	D	Wil.	P.III P.III P.III	WG	Nb-Spi Nb-Spi Nb-Spi	1/2 Spi	LH LH LH	
Hudson 6-63 Hudson 8, 64-5-6-7 Hupmobile 618-0 Hupmobile 621-N	855 815	120 120–127 118 121	6.00/16 6.25/16 6.00/16 6.50/16	6-3x5 8-3x4½ 6-3½x4¼ 8-3¾x4¾	21.6 28.8 29.4 32.8	3 212.0 8 254.4 4 245.3 5 303.2	93–380 113–380 101–360 120–350	0 6.26 0 6.06 0 5.76 0 5.8	5 CI. 0 CI. 5 CI. 0 CI.	Ge°. Ge°. Mor. Mor.	Al Als Als	No No No	AC AC Bur Bur	Car Car Car	Old Old Old	A	Nat.	P.Ownt	Own.	Nb-Spi Nb-Spi Nb-UP Nb-UP			
Lafayette3610 La Salle36-50	675 1185	113 120	6.00/16 7.00/16	6-31/4x43/6-3x43/8			83-320 105-360						AC.	Str	Old.	A D	USL.	P.B&B. P.B&B.	Own. Own.			BH	
LincolnZephy LincolnV12		122 136–145	7.00/16 7.50/17	12-23/4x38/ 12-31/8x41/							St Ala.	Pur.	AC.	Str	Own Own		Exi.	P.Long.	Own.	m-Spi	34 Own FF Tim.	M BP	
NashAmbassado			6.25/16	6-33/8x43/	8 27.	3 234.0	90-340	0 5.7	OCI.	. Own	. Als.		AC.			. A	USL	P.B&B.	Own.	Nb-Mec	1/2 Own	ВН	
Nash Amb. Super		125	6.50/16	8-3½x4½					1				AC.			. A	USL	P.B&B.	Own.	Nb-Mec	1/2 Own	ВН	
Nash400	740	117	6.00/16	6-33/8x43	8 27.	3 234.0	90-340	0 5.5	8 CI.	. Own	. Als.		AC.	. Str		. A	USL	P.B&B.	. Own	Nb	1/2 Own	ВН	
OldsmobileF3	6 795 6 910		6.50/16 7.00/16	6-35/6x41/ 8-3x41/4	8 26.	3 213 .3 8 240 .3	90-340 100-340	00 6.0 00 6.2	0 CI.	. Whit	Ala.	No	AC.	. Car Car	Hay.	. D	Del.	. P.B&B.	. Own	Nb-Mec	1/2 Own. 1/2 Own.	. BH	
Packard 36-1201 Packard Super Packard Twelv Pierce-Arrow 43 Pierce-Arrow 160 Pierce-Arrow 160	8 2385 8 2990 e 3960 8 3195 2 3695	127-34-39 132-39-44 132-39-44 138-144 138-144	7.00/17 7.50/17 7.00/17	8-3½x4½ 8-3½x5 8-3½x5 12-3½x4½ 8-3½x5 12-3½x4 12-3½x4	32. 39. 4 56. 39.	5 320.0 2 384.3	8 150-320 0 175-320 150-340 185-340	00 6.5 00 6.3 00 6.4 00 6.4	0 Al. 0 Al. 0 Al. 0 Al.	. Mor . Mor . Mor . Whi . Whi	Als. Als. Als. t. Als. t. Als.	Pur. Pur. Pur. Pur.	AC. AC. Ste. Ste.	Str Str Str Str Str Str Str		A NI AI DI DI	Del. Pre. Pre. Pre. Wil. Wil.	P.Long. P.Long. P.Long. P.Long. dp.Long dp.Long dp.Long	Own Own Own Own Own Own Own	Nb-Mec Nb-UP. Nb-Spi. Nb-Spi. Nb-UP. Nb-UP. Nb-UP.	1/2 Own. 1/2 Own. 1/2 Own. 1/2 Own. 1/2 Own. 1/2 Own. 1/2 Own.	LH. BP. BP. Ste. Ste. Ste.	
Plymouth P Plymouth	z 720 x 720	113 112 112	5.25/17 6.00/16 6.00/16 6.00/16 6.50/16	6-33/8x37	8 23 8 27 8 27	4 201. 4 208. 4 208.	3 82-36 0 80-36 0 80-3 6	00 6.7 00 6.2 00 6.3	0 CI 20 CI 20 CI	Ch Own	Ala. Chl. Chl.	No.	AC.	Car	. Own	. A A D D	Wil. Wil. Del. Del.	P.B&B. P.B&B. P.Own. P.Own.	Own Own Own	Nb-UP. Nb-UP. m-Own. m-Own.	1½ Own. 1½ Own. 1½ Own. 1½ Own. 1½ Own.	LH. LH. BH.	
Reo Fly. Cld. 193	6 795	115	6.25/16	6-38/sx41	4 27.	3 228.	0 90-34	00 6.8	50 Al.	. Mor	Al	Pur.	AC.	. Car	. Old.	. D	. Wil.	. P.B&B.	. WG.	. Nb-Spi.	. 1/2 Spi	LH.	
StudebakerDict. Studebaker.DictP StudebakerPres.	1	116	6.00/16 6.00/16 6.50/16	6-31/4×43	8 30	0 217.	8 90-34	00 6.3	30 CI	Dia	Ly	Pur.	. Bur.	Str Str	. Bur.	. A	. Wil.	. P.B&B.	. WG.	. Nb-Spi.	. ½ Spi ½ Spi ½ Spi	LH.	
Terrap' DeL.& Cus.			6.00/16	6-3x5	21.	6 212.	0 88-38	00 6.0	00 Al	Ge°	Al	. No	AC.	. Car	Old.	. A	. Nat	P.Own	. Own	. Nb-Spi.	. 1/2 Own.	. НМ.	
Willys7	7 39	100	5.00/17	4-31/8x43	15.	6 134.	2 48-32	00 5.	70 CI	LB.	. CI	. No	. Mo.	. Til	. Buf	A	. USL	P.B&B	. Own	. m-UP	. 1/2 Own.	. BM.	

ABBREVIATIONS

"Others Used

"Generator and Starter Autolite

"Power Clutch

"Semi-Floating

"Three Quarters Floating

Al-Aluminum

Ala-Anode-processed

Als-Aluminum Alloy with Strut

Ch-Chain

Chl.—Chrome Nickel Iron

Cl—Cast Iron
dp—Double Plate
F—Fabric
FF—Full Floating
m—Metal
Ly—Lynite
N—No or None
Nb—Needle Bearing
OT—Overdrive Transmission
P—(Clutch) Single Plate

s—Super Charged Tu—Tubular

ABBREVIATIONS (Make of Units)

1—Owen-Dyneto for Generator and Starter
A—Autolite AC—AC Spark Plug
B&B—Borg and Beck
B&B—Ball and Ball (Carter)
BH—Bendix Hydraulic Operated
BM—Bendix Mechanical (Brakes)
BP—Bendix Power Operated (Brakes)

Buf—Buffalo
Bur—Burgess Car—Carter
Ch—Champion
Col—Columbia
Cu—Cun
D—Deleo-Remy

Del—Delco-Remy
Del—Delco
Det—Detroit
Dia—Diamond
DL—Detroit Lubricator Co.

Exi—Exide
Fle—Fleming
G—Gemmer (Steering)
Glo—Globe
Han—Handy
Hay—Hayes-Ind.
HM—Hydraulic Mechanical
III—Illinois
LB—Li nk Belt
LH—Lockheed Hydraulic (Brakes)

Tune-Up Specifications

Car Manufacturers and Supersedes All Others Previously Published

the

Steering Gear Make

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		KIIV	GS			-				VALVES							IGNITION									3	FRONT AXLE						
(Lbs.)	Spark Plug	Comp.	liC	eter	ed in	H	nd S	Diam eat A	ngle	(Jac.)	1	erating appet earance	Clearance	Oper	ke Valve is Befor fter T. C	e -	up (Ins.)	(Ins.)	-	Timing		m	(Ins.)	ins.)	<u> </u>	System (Qts.)							
Cranking Speed (Lbs.)	Make and Type	No. and Width	No. and Width Oil	Piston Pin Diameter	Piston Pin Locked	Inlet (Ins.)	Inlet Seat Angle	(Degrees)	Sea	60 h		Exhaust	Inlet Tappet Clea	No. of Degrees	No. of Flywheel	eth oo	iker Point		Spark Occurs °TC	No. of Flyw. Teeth Spark Occurs TC	Breaker Housing	Rods Removed Fron	Crankpin Diameter		Cranko	y Cooling	Caster (Degrees)	Camber (Inches)	Toe-in (Inches)	ng Pin Inclination	(S)		
	Ch-J6	2-1/8	1-1/8	7/8	R	1%	30	11	1	1	2 010H	.010H	<u> </u>	2 716B	i	3. 110	1	1 1	_	1	Au	i	T	1	i	1	1	1	- P	K	Line		
	Ch-J6	2-1/8	1-1/8 1-3/8	7/8	R.	1%	30	113	3 4	5 .34	2 010H	I .010H		2 71/2B		3. 110	.018			1B	Au			11/4	8 20	1	4 13	1.5	1/8		1/2 1		
		2-1/8	1-8/6	7/8	R	1%		"			2 010H		.01	2 73/2B	21/4B	. 110	.013	.025	3B	1B	Au				8 20	-	13		1/8		1/2 2 1/2 3		
A		$2-\frac{3}{32}$ $2-\frac{1}{8}$		1/2	R	117	45							TC		. 80	.020	1			Re		1%	11/4	4 6	5		1-1/	1/11	4.	1/2 4		
A	AC-H9 AC-H9 AC-H9	2-1/8 2-1/8 2-1/8	32 32 32 5 32 5 33		R R R	$1\frac{17}{32}$ $1\frac{25}{32}$ $1\frac{25}{32}$ $1\frac{25}{32}$ $1\frac{25}{32}$	45 45 45	13 13 13	16 48 16 48 16 48	5 .37	1 .015 1 .015 1 .015 1 .015	.015 .015 .015 .015	.004	4 14B.	31/4B 6B. 6B.	156	.015 .015 .015	.025 .025 .025 .025	2B 10B 10B 10B	34B 414B. 414B. 414B.	12 A 12 A 12 A 12 A	A. A. A. A.	4 1	%6 5/6	6 13 8 17 8 17 8 17	3-31 134- 134- 34-1	21/4	-1/4,- -1/4,- -1/4,- -1/4,-	34 16 - 1/8 34 16 - 1/8 34 16 - 1/8	4 5 5 5	5		
A	AC-K9 AC-K9 AC-G6 AC-G6	$ \begin{array}{c c} 2-\frac{1}{8} & 2 \\ 2-\frac{1}{8} & 2 \\ 3-\frac{3}{32} & 1 \\ 3-\frac{3}{32} & 1 \end{array} $	32 -83 -53 -32 -632	7/8	P	1.87 1.87 1.51 1.51	45 45 45 45	1.6	2 45 9 45	34	AA	AA AA AA	. 0	TC TC TC	TC.	156	.015 .015 .021 .016	.026 .026 .026	SR.		44	1 2	46 9	1 32 1 32	7 30 7 29 9 19	11/2- 3/4-1 3/4-1 11/2	2	1/4-1 0-1/2 0-1/2	0-1/6 0-1/6 0-1/6 0-1/6 1/8-3/6	40			
2 A 2 A 2 A	AC-K11 AC-K11 AC-K11	$ \begin{array}{c c} 2-\frac{1}{8} & 1 \\ 2-\frac{1}{8} & 1 \\ 2-\frac{1}{8} & 1 \end{array} $	-8/16 -8/16 -8/16	.99	R R R	$1^{\frac{41}{64}}_{\frac{64}{64}}$ $1^{\frac{41}{64}}_{\frac{64}{64}}$	30 30 30	$1\frac{1}{3}$ $1\frac{1}{3}$ $1\frac{1}{3}$	30) 11/2	.006H .006H	.013H	.006	9B 9B 9B	3 ¹ / ₄ B 3 ¹ / ₄ B 3 ¹ / ₄ B	133	.021 .021 .021	.032		184B. 184B. 184B. 184B.		- 1	1/8 1 1/8 1	9 32 9 32	5 15 5 15 5 15	23/4±	1/2	1 1±1/4	5-16	71 78	13		
. A A A C	C C C C Ch-J9B	$ \begin{array}{c c} 2-1/8 & 2 \\ 2-1/8 & 2 \\ 2-1/9 & 2 \\ 2-1/8 & 2 \\ 2-3-1 & 1 \end{array} $	32 5 32 5 32 5 32 5	55	F F F F	$1\frac{17}{32} \\ 1\frac{15}{32} \\ 1\frac{15}{32} \\ 1\frac{15}{32} \\ 1\frac{15}{32} \\ 1\frac{23}{32} \\ 1\frac{23}{32}$	45 45 45 45 30	13 13 13 13 13	45 45 45	.34	H300.006H 0.006H 0.006H 0.006H	H800. I H800. I H800. I	.011	2B	34B 34B 34B	146	.020 .018 .018	.025	rc rc rc	TC TC TC	Au	1. 2	1/8 1 3/6 1 3/6 1	1/8 1/8 1/8	6 19 6 22	11/2		† † †	0-5/6 0-5/6 0-5/6	13	4 16 4 17 18 19		
. A . A	C.	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	32 5 32 5 32 5 32 5	5645	F F	$1\frac{17}{32}$ $1\frac{17}{32}$ $1\frac{15}{32}$	45 45 45	135 135 135 135 135 176	45	.340	010H 0.006H 0.006H 0.006H	.008H	.012	7½B. TC TC 6A	TC	146 146	.018 .020 .020 .020	.025 3 .025 7 .025 5	B	TC	Au A		16 1	1/8	6 19 6 19	1/2	••	† †	0-5/6				
5 C	h-C7	2-3 1	5 32		F	$1\frac{1}{2}$ $1\frac{17}{32}$	30 45	1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		1	.015C	.015C	.025	6B	2B		.021	.025 1	½"B*	1½A.	Ad .	2	1/8 1 1/6 1 7/6 1		15 2 32	2 3		11	0-3/16 0-3/16 1/4	93	23 24		
	h-C7 2 h-14MM 2 h-18MM 2				R	133	30	1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	1	1	.010H	.013C			3B		.013	.025 4		1¼B.					22	7		3/4	1/6-1/8		4 25		
CI	h-18MM. 2	2-1/8 1-1/8 2-3/2 2-3/2 2-3/2	3/6 -3/6	18	R	133 133 164 138	30 30 45	1 2 1 1 2 1 1 2 1 1 3 8 1 3 8	45	16	.010H .010H	.010H			1½B. 1½B. 1½B.		.018 .018	.025 2	В	34B	Au A	1	% 1 % 1 % 1	16 5 16 5 16 5	15 15 15 15	21/2 21/2 21/2 21/2	3/4 3/4	1	1/8 1/8 1/8	71. 71. 71.	26 27 22 28		
	h-J8 2 h-J8 2 h-C7A 2 h-C7A 2 h-C15 2		- 1	34 1 34 1 7/8 1 7/8 1	7.7.	$ \begin{array}{c} 11_{2} \\ 1\frac{21}{32} \\ 1\frac{17}{32} \end{array} $	45 45 45	$\begin{array}{c c} 13 & \\ 1\frac{17}{32} \\ 1\frac{13}{32} \end{array}$	45	3/8 .340 .340	.006H .006H .010 .006	.008H .013 .013	.010	10%B	314B. 4B. 12B. 14A.	134	.020 .020 .018 .016	.022 T .022 T .028 7 .028 7	C	TC TC 214B. 214B.	Au A Au A Ad A Ad B	11	% 1 1 8 1 1 8 1 1 8 1 1 1 1 1 1 1 1 1 1	8 9	13 23 18 21 ¹	2±1/2 2±1/2 11/2 11/2	1-1		0-1/8 0-1/8 1/6-3/6 1/6-3/6	7 71 71 71 71 71 71 71 71 71 71 71 71 71	29 30 31 232		
A	C-K9 2	-1/8 1-	1/8	7/8 55 64	2	$\frac{1\frac{21}{32}}{1\frac{9}{16}}$	45 30	$1^{\frac{17}{32}}_{\frac{13}{32}}$	45 45	11	.015 .006C	.015 .009C	.015	6A	2½A.	104 145	.020	.023 10 .025 81	DB 3	3B 31/4B.	Au A	2	1	7	19 18	21/2		11/2	1/8 1/8	7	33		
	MM 2 2	-1/8 2-	33	7/8 I		.54 111/16	45 45	1.54	45 45	.311	.004C	.006C	.004	21B	63/4B.	116	020	022 71		21/4B. A	p	91	8		27	71/2		3/4	/8	4%	34		
		-1/8 1- 1-			.		45	119/32	45	.372	.015H	.015H	.015					025			A	1	1 1 1		32 1714	21/2	34	1	0-1/8	71/2	36		
	C-K12 2				.		45	115	45		.015H	.015H					.020 .	025 15	В		В	. 2	12		21	21/2		111	1/8 1/8		37 38		
		1-	%				45	117	45	.341	.015	.015	.015				.020 .	025			A.	2	11	9 7	18	21/2		. 11/2	1/8		39		
AC	C-G9 2-	-1/8 2- -1/8 2-	% B	F P		1%6	30 30	$1\frac{27}{64}$ $1\frac{27}{64}$	45 45	11 11 12		.010H .010H		5B TC	2B TC	145 145	.020 .015	033 T	C 7	C A	u A.	2 23	13	8 6	13	11/2-21 11/2-21	4 3/6-3	½ ½-1	1/8-3/6	5°51′	40		
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M—Midland Steeldraulic
Mar—Marvel
Mor—Morse
Mun—Muncie
Nat—National
N—Northeast (Ignition)
Nb—Needle Bearing
0—Own
0H—Own Hydraulic
OM—Own Mechanical
Old—Oldberg

Pre—Prest-O-Lite
Pur—Purolator
R—Ross
S—Saginaw
Sal—Salisbury
Spi—Spicer
Spir—Spiral Gear
Ste—Stewart-Warner
Str—Stromberg
Til—Tillotson
Tim—Timken

UP—Universal Products
Wal—Walker
WG—Wagner Gear Co.
Whit—Whitney
Wil—Willard
Zen—Zenth

ABBREVIATIONS § Rods below—Pistons above †—(-1/4 to+1/2) †—(1/2±1/4)

*—Measured on rim of flywheel
A—After
A—Above (Rod removal)
AA—Automatic Adjuster
Ad—Advanced
Au—Automatic
B—(Valve and Ignition timing)—Before
B—Below (Rod removal)
C—Cold (Tappet clearance)
F—Flat
F—(Pin locked in) Floating

H—Hot
L—Link
Ma—Manual
N—None
P—(Pin locked in) Piston
R—(Pin locked in) Rod
Re—Retarded
S—Slide
s—Sectors
TC—Top Center



How many times were you called on to start cars last winter because batteries were down?

Think of the delays, the irritation, and the constant expense, for your good customers. Make them friends for life by installing the

CONNECTICUT AUTOMATIC KWIK-START

Battery voltages of new as well as old cars do get The KWIK-START by means of ordinary flashlight batteries supplements the storage battery so that the normal voltage necessary is always available for sure and instant starting. It is automatic, operating by the starting switch. A real instrument. You get three profits at one time-for the KWIK-START, the batteries, and the installation charge, but

Retail Price \$2.95

without batteries

still the low cost is worth it. KWIK-START is attractively packaged for counter display and sold only through recognized jobbers. Get your stock now.



CONNECTICUT * ELECTRIC CORPORATION CONNECTICUT

Manufacturers of DIRECTIONAL SIGNALS and ignition devices.

How To Make A Midget Racer

(Continued from page 27)

the case of the rear axle, the cut is taken off each end, inside of the brake backing plate. Six inches off each end, with careful aligning of the housing when welding it back together, will bring the right size. Rear axle shafts are cut in proportion. The front axle is braced by radius rods, 231/2 in. long, attached to the underside of the front axle at the spring perch and to the frame side rail at a point 191/2 in. from the front of the frame. The rear axle is likewise braced by radius rods which are 341/2 in. long, and are attached to the frame side rails at a point 33 in. from the rear end of the frame.

GAS TANK-Of two or three-gallon capacity, and is mounted on brackets welded to the frame in the rear body assembly, directly in back of the driver. Its shape and mounting depend upon the form of the rear body assembly.

STEERING—Many midget builders prefer an old Franklin steering gear assembly with an Austin steering The mounting of the steering depends entirely on the type of engine used, but in all cases it is mounted in the center of the instrument panel, which, of course, makes the steering column and the gear box centrally located with respect to the frame side rails. On this particular car the gear box is mounted on a flat piece of iron, 5 in. wide by 1/4 in. thick, which acts also as a frame cross member.

You will note the shape of this bracket in the accompanying illustration. The bracket was bolted and welded to the frame side rail, and the steering gear assembly bolted at the center. This location of the steering gear makes it necessary to lengthen the steering Pitman arm shaft so that it will extend through a slot in the side of the cowl metal, and enable the Pitman arm to swing through its arc on the outside of the frame side rail and at a height that will put the Pitman arm ball stud on a horizontal plane with the steering third arm ball stud. The length of the steering drag link is, of course, dependent on the location of the steering gear—in the case under discussion the drag link was 34% in. overall. The tie rod is cut to correspond with the axle I beam, and the steering arms and spindles as well as the wheel hubs are the regular Model T parts. A bracket bolted to the outside of the frame side rail forms a support for the outer end of the Pitman arm shaft.

BRAKES-The regular Ford brakes are used on the rear only, and the brake lever is mounted at the left, on the outside of the car. The brake cross shaft is mounted underneath the frame at a point 21 in. from the rear, and is bent "U" shaped where it passes under the center of the car, to allow room for the torque tube.

COOLING-Here again it is necessary to know the type of engine to be used before any progress can be made in developing a radiator. Generally, however, a 4-in. tubular core has been found to be most satisfactory—the frontal area to be as great as possible. Water capacity is usually about three gallons.

BODY-Before attempting to design the body, all of the foregoing must be completed, as the body has to be made to fit the chassis. The body is made in two major divisions, the cowl assembly and the rear body assembly. The dividing line is near the center of the driver's cockpit, depend-

ing on which point is most convenient.

The cowl assembly is made all in one piece, and the accompanying illustrations show the general layout and the dimensions. When the general size and shape have been determined, suitable braces of the type illustrated should be made. Three-quarter-inch angle iron will be suitable for this work. The horizontal pieces of iron are laid out with the vertical side of the angle toward the inside of the car, and the vertical braces are electrically welded to it, as shown in the end view. This framework is made about 2 in. narrower than the chassis, and when completed is welded to the chassis side rails, forming a rigid support for the entire assembly. The cowl metal does not fasten to this framework, but rather is placed over it like a hood. The cowl metal is flanged outward at the point where it meets the car frame, and rests on the angle iron just mentioned. Three bolts on each side, the heads of which are welded to the underside of the frame upper flange, project through the frame flange and the angle iron. The cowl metal is drilled to accommodate these bolts, and is held to them by regular washers and nuts. This makes a very convenient method of mounting the cowl assembly. When the three nuts and washers on each side are removed, the entire cowl assembly may be lifted off, making the transmission and clutch accessible for repair.

The edge of the cowl metal forming the driver's cockpit should be rolled to eliminate the sharp edge. Above the instrument panel and for a short distance down the sides, the metal is flared upward and outward by dinging, to

form a windbreak for the driver.

The fire wall may be welded directly to the cowl metal. If it is desired to make a neat appearance, let the edges of the fire wall project about ¼ in. all around, and cover the edges with split copper tubing that has been chrome plated. The fire wall should be as close to the motor as possible, and should have only the minimum number of holes in it.

The instrument panel is welded to the frame, and not to the cowl metal. This permits the cowl to be lifted off as mentioned, without interfering with the steering assembly or instruments. A tachometer and an oil gage, with an air gage for measuring the air pressure in the fuel tank,

are the essential instruments.

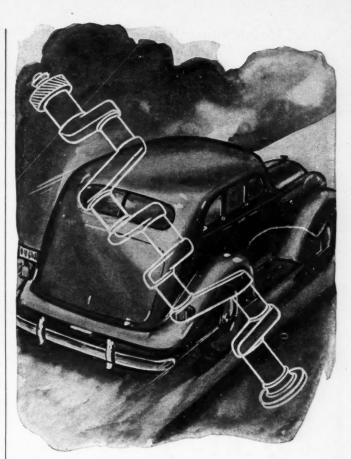
The rear body assembly is rather difficult to make, and requires considerable hand work to form it in shape. Some midget car builders use the rear quarter or back panels of an old passenger car which will give the approximate curves desired. In one case two front fenders were used as a basis for the rear assembly, the fender curves matching very closely the form of the body desired. If it is impossible to locate suitable metal panels and have to make the assembly out of new material, it can be made in three pieces, two sides and a top. Cut the pieces from sheet iron in accordance with the dimensions given in the illustration. Then shape the two side pieces and hold these in approximately the correct position while making the weld at the extreme rear. This will simplify forming the top piece, which is then welded in place.

HOOD—After the radiator shell and cowl assembly have been designed it is a simple matter to form the hood. After cutting to the dimensions given, it is bent to shape. It is held in place by straps over the top, fastened to the frame

side rails.



REFLECTOR numerals recommended for use on license plates. As an aid to police this exhibit was recommended because the reflectors on the numbers make license tags visible at night.



An Auxiliary Lubricant

The modern era in transportation calls for the utmost in protection for the moving parts of engines from which so much is demanded.

The use of auxiliary lubricants containing "Oildag"* Brand colloidal graphite (in oil) will go far toward safeguarding the friction parts.

These are invaluable when employed in new and rebuilt engines during the run-in period. Forming a smooth, lubricating film of graphite on the friction parts, these lubricants protect against metal-to-metal contact should oil film rupture occur. For a complete job, the use of both a colloidal-graphited crankcase and upper cylinder oil is recommended. This treatment on new engines particularly will carry on the good work of many large engine manufacturers who set-up their mechanisms at the factory with this material.

Send for our Technical Bulletins A112 and B242 discussing the use of this material for run-in and for alloy bearings.

ACHESON

COLLOIDS CORPORATION
FOUNDED [1908] AS ACHESON DILDAG COMPANY
PORT HURON MICHIGAN

Penna. Maintenance Men **Elect New Officers**

The Automotive Maintenance Assn. of Pennsylvania, Inc., has elected the following officers for the coming year: James H. Mitchell, president; Charles R. Gilfert, vice-president; Harold Cummings, secretary, and Elmer R. Keyworth, treasurer. The following directors were elected to serve a term of two years: Frank Fuchs, Leslie Christy, Walter Weigle, Al Steinmetz, Sr., Elwood Keiser and Charles

Ignition-Ite Protects Motor in Wet Weather

As an aid in starting a motor after the ignition system has become water soaked Ignition-Ite is being distributed by Loynes Motor Service, 243 Chestnut Ave., Long Beach, Cal. If this liquid is applied to the spark plugs, wires, distributor cap and coil it will effectually protect the ignition system from short circuit caused by rain, snow or ice, according to the manufacturer. It can also be applied to battery terminals to prevent corrosion. Retail price, \$.75 per bottle

Hudson Stages Service Clinics



T. A. Stambaugh

Eighty-two "service clinics" in major cities covering the entire United States are being conducted by the Hudson Motor Car Company, carrying the latest developments in service operations as worked out by engineers in the factory to

the more than 12,000 garage and service station men of the Hudson and Terraplane organization.

These "clinics" will be under the direction of district service supervisors, who have been spending some time at the factory in Detroit attending a special school in service operations conducted under the personal direction of T. A. Stambaugh, general service manager. Special attention will be given to the merchandising of labor, parts and accessories. Mer-chandising of seasonal merchandise such as car heaters, windshield de-frosters, polishes and cleaners, etc., will be stressed.

Rust-Proof Water Jacket Plates for Replacement

Due to the static reaction that develops between two different metals the detachable side plates on cylinder



block water jackets frequently rust out. To meet this situation the Dorman Star Washer Co. of Cincinnati, Ohio, is supplying cadmium plated water jacket plates for all makes of cars and trucks that have this construction. In addition to being rustproof these plates are said to improve the appearance of the motor due to their bright finish. They are made of heavy material and the baffles are welded in place, instead of riveting.

Lacquer Mixing for Touch-Up Jobs

The ArcoZon Production Color Laboratory is designed to supply a small quantity of paint that will exactly match the color of the car being worked on. The machine is complete with means for agitation, pouring, gage for measuring, mechanical mixing and other devices. It utilizes constant strength, concentrated base pigments. The Arco Co., 7301 Bessemer Ave., Cleveland, Ohio, is the manufacturer of this equip-



DEALERS WANTED to COVERED WAGON trailer coaches

- A YEAR ROUND BUSINESS
- TREMENDOUS PROFIT POSSIBILITIES
- GROW WITH A GROWING BUSINESS Mealtime in the De Luxe Six can be ac Six can be ac Six can be acted. BACKED BY NATIONAL ADVERTISING

heating stove— concealed sink, etc.

RETAIL PRICES

\$395 for Master Model

f. o. b. Detroit \$785 for De Luxe Model

f. o. b. Detroit

Thousands of travel hungry, sports loving people are now turning to trailer ownership. Here's a new business that is growing by leaps and bounds. Unusual profit possibilities exist. Cash in with our liberal dealer discounts. Trailers have become an integral part of the automobile dealer business—without the Looking forward, showing disadvantage of the the extra daventrade-in problem. to accommodate two additional ANDYOUCAN Master Model.

mpartmei kitchen—

SELL COVERED WAGONS AT NO ADDED EXPENSE! Investigate—it costs only a postage stamp.

Many Covered Wagon dealers are now showing a profit of \$4,000 to \$10,000 yearly -with sales stepping up every month. Write, wire or phone for information.

COVERED WAGON COMPANY

Mt. Clemens, Michigan (Suburb of Detroit) The World's Largest Builders of Trailer Coaches



COMPLETELY Restoring a worn motor to its HIGHEST possible efficiency!

YDRAULI

Only HYDRAULICS Can do ALL of these things ... and do them even

in badly worn engines.

1. STOP OIL WASTE

2. INCREASE SPEED

3. STEP UP POWER

4. SAVE GASOLINE

5. IMPROVE PICK-UP

6. ASSURE LASTING

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"THE FINEST PISTON INSTALLATION AT ANY PRICE!"

Compression

Oil-Control

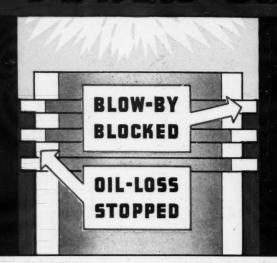
SEE THE PROOF ON NEXT PAGE!

THE SECRET OF BETTER PISTON RING PERFORMANCE IS NOT JUST "Oil Control"

POWER CONTRO BUT COMPLETE

"Blow-By" Must Be Prevented to Assure Pick-Up, Pep and Power!

The power of a motor comes from the pressure of burning gas against the top of the piston. When part of the force of this pressure is wasted by excessive leakage past the piston rings, the result is a weak, sluggish motor. Also, this leakage, or "blowby," drives the oil back, leaving the cylinder walls poorly lubricated, which produces increased friction and heat. Hydraulic Reconditioning provides a tight liquid seal, the best possible prevention of blow-by, which restores power - quickens pick-up-and increases gasoline mileage even in badly worn or "out-of-round" cylinders.



ONLY HYDRAULIC RECONDITIONING GIVES THIS KIND OF PERFORMANCE Don't Be Fooled By the Ring That Stops Only Oil Loss!

Because tremendous emphasis has always been placed on "oil control" in piston ring performance, the tendency of several ring manufacturers has been to sacrifice other important features to deliver maximum "oil control" results. For instance, by sacrificing "blow-by" control, the possibility for oil loss is reduced due to the fact that the blow-by itself drives the oil back and, although the necessary lubrication of the cylinder walls is seriously impaired, the so-called "oil control" results appear very good. To be sure of real piston ring performance, make certain that the rings you use not only stop oil loss but prevent blow-by, too!

Redrick HYDRAULICS CONTROL Both BLOW-BY AND

and do it more thoroughly than is possible with any other ring installation



This cross-section illustration shows how the Hydraulic compression ring prevents leakage by carrying a ring of oil up and down the cylinder.

Hydraulic pressure is built up be-tween and back of the ring sections. The black arrows in the illustration show the direction and action of the oil (indicated in red) which is scraped from the cylinder by and through the two ring sections. The pressure between the sections holds

WHY! them firmly against the sides of the groove while the oil behind them keeps the face of the ring at the wall. The ring sections act independently of each other, dis-lodging carbon accumulations, pre-venting clogging and assuring longer life.

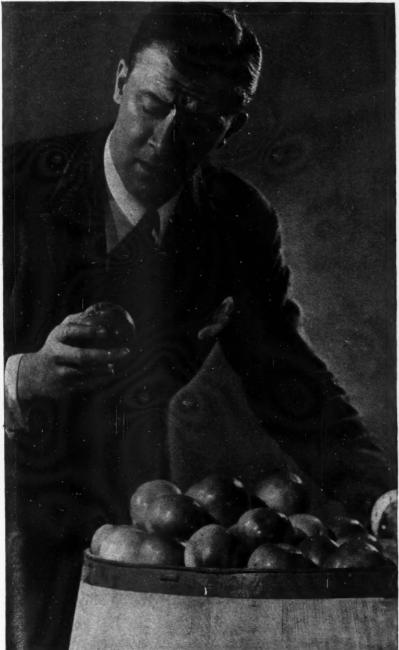
Thus, by means of Hydraulic Action, a tight liquid seal is provided, which is sufficiently flexible to follow a worn cylinder, and blow-by is prevented with an absolute minimum of friction.

Wilkening Manufacturing Co. Philadelphia

Export Department: Overseas Motor Service Corp., New York In Canada: Wilkening Manufacturing Co. (Canada) Ltd., Toronto

NEXT MONTH THE NEWS BREAKS ON PEDRICK'S BIG LEADER CAMPAIGN!

What's going on in your Apple Barrel?



OWNERS' opinions are like apples in a barrel—one bad one can spoil a lot of good ones.

But one owner completely *sold* on his new car—can do you no end of good. He'll send you prospects that are already in a buying mood.

That is why a growing number of car dealers are taking this step toward keeping every "apple" in the "barrel" sweet.

They are starting off every new car they sell with a crankcase full of the world's finest motor oil—Gulfpride—and a tankful of liquid lightning—Gulf No-Nox Aviation Grade Gasoline.

Gulfpride can do more than any other oil to rule out little mechanical troubles. Thanks to Gulf's exclusive Alchlor refining process, this 100% Pure Pennsylvania oil is completely free from trouble-breeding impurities. It forms less sludge, less gum, less carbon than any other oil in the world—bar none!

Dealers find it's good business, too, to start off those new cars with Gulf No-Nox Aviation Grade Ethyl Gas. For with this gasoline in the tank, a powerful car becomes a super-powerful car . . . makes "high-gear hills" out of "second-gear hills"—is more completely alive!

Use Gulfpride and No-Nox Aviation Grade gas in every new car. You'll be doing more than ever before to make owners say, "It's a sweet automobile!"



GULF REFINING COMPANY

PITTSBURGH, PA.

District Sales Offices:
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HOUSTON PITTSBURGH LOUISVILLE TOLEDO

GULF REFINING COMPANY 3800 Gulf Building, Pittsburgh, Pa. MA-12-35

Please send full information about your special plan for motor car distributors and dealers.

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City	State

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DOUBLE Mileage DOUBLE Safety

for the Motorist

FAIR PROFIT FOR THE DEALER

- The Bar-Reinforced principle (protected by thirty-two United States and Canadian Letters Patent) offers the merchandisingminded dealer five distinct advantages:
- It permits him to sell new type Tire Chains that provide double the safety provided by ordinary chains.
- 2 It enables him to sell Tire Chains that give the motorist double the wear obtained from ordinary chains.
- 3 It affords him an opportunity to win the trade of all motorists in his community who want the best; who will and can pay for the best.
- 4 It lifts him above the level of competition that has nothing to offer except so-called "bargain" and "loss leader" merchandise.
- 5 It earns for him an honest, legitimate profit.

Bar-Reinforced Tire Chains are now offered under the following brand names: Hodell Bar-Reinforced, Pyrene Doubleduty, McKay

THESE SIX
MANUFACTURERS OFFER
BAR-REINFORCED
TIRE CHAINS

CHAIN PRODUCTS COMPANY, CLEVELAND, OHIO PYRENE MANUFACTURING COMPANY, NEWARK, N. J.

THE McKAY COMPANY, PITTSBURGH, PA.

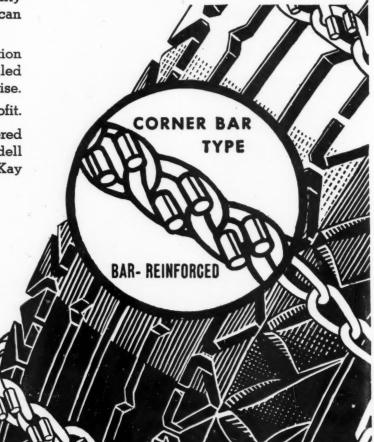
PYRENE MFG. COMPANY OF CANADA, LTD., TORONTO, ONTARIO

DOMINION CHAIN COMPANY, LTD., NIAGARA FALLS, ONTARIO

AMERICAN CHAIN COMPANY, INC., BRIDGEPORT, CONN. Multigrip, Pyrene Doubleduty (Canada), Weed American Bar-Reinforced (Canada), and Weed American Bar-Reinforced. They are distributed only through regular automotive service wholesalers.

A powerful advertising campaign will educate the public to demand Bar-Reinforced Tire Chains. The public will quickly understand that these Tire Chains increase the safety factor.

Phone, call or write your wholesaler at once. Don't miss this great opportunity.



BAR-REINFORCED TIRE CHAINS



5 FEATURES
EXCLUSIVE
IN THESE 6
TIRE CHAINS

LARGER SALES
AT A GREATER
PROFIT FOR
THE DEALER

- 1 Reinforcing bars dig deep like cleats on a tractor.
- **2** Reinforcing bars project well above the level of cross chain links, reducing side skids.
- 3 Reinforcing bars provide double the wearing surface.
- 4 Reinforcing bars are double welded to cross chain links—they can't come off.
- 5 Reinforcing bars are case hardened to just the exact depth that insures maximum toughness.
- These features constitute a real selling story. Display one of the six brands of Bar-Reinforced Tire Chains listed below. All these brands are licensed to use the patented Bar-Reinforcing principle. Only in these brands do you get the sales advantages of Bar-Reinforcing. Only from these brands does the motorist get double mileage and double safety.

Stock Only These Brand Names

HODELL BAR-REINFORCED • PYRENE DOUBLEDUTY • McKAY MULTIGRIP
PYRENE DOUBLEDUTY (CANADA) • WEED AMERICAN BAR-REINFORCED (CANADA)
WEED AMERICAN BAR-REINFORCED

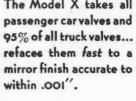
Greater Sales-Larger Profits

Cash in on this Fact ... 12% OF ALL MOTOR RECONDITIO

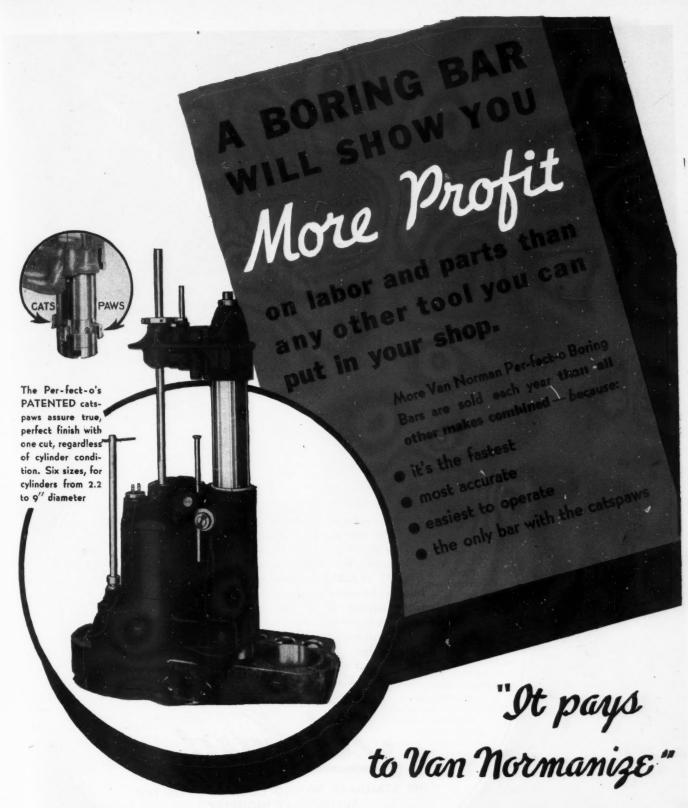
With the Model X, thousands of owners are making the highest possible profit per maintains its accuracy for years. valve _ because: has the lowest upkeep cost

· it's low in cost it's fast

The Model X takes all passenger car valves and



MACHINE TOOL COMPA NORMAN



RMAN

SPRINGFIELD, MASSACHUSÉTTS, U. S. A.

December, 1935

AGE



We are Discovering, New World!



And with our product. Right now is the time to cash-in on this new erathe new lubricant auxiliary.

We have a sound, money-making offer, to men of foresight and ambition.

This new lubricating element is your opportunity. Do not let it slip from your grasp. Send in today for your test samples and full information on our sales plans. Address

era. The old economic system has passed. Business operates under new rules. In just a few short weeks a breathtaking revolution has taken place. New Laws, new purposes, new ideas—these are creating a new world.

And this "revolution" affects everything-every business and every person.

The chemical world, too, is all upset-revolutionized.

And this brings us to MERCUROIL.

For years we have been compounding colloidal graphite, distilled mercury, cold-pressed castor oil and Pennsylvania mineral oil, the elements that make our product, in steam jacket tanks, completing the compounding by violent agitation. We have supposed all the time that we were furnishing the motoring world with the one supreme lubricating auxiliary. The motoring world thought so too.

But now comes the thing that has upset the entire chemical world—the new ALKIRE EMOGINIZING PROCESS!

A super-emulsification method would, in a way, characterize this new process.

Into the ALKIRE EMOGINIZER is supplied the elements (predetermined in ratio) that make MER-CUROIL. Pressure is then imposed by pumps, up to as high as 15,000 lbs. per square inch. The break-down in molecular structure, upon release, is so complete, that the resultant product partakes of the nature of a chemical union, rather than that of a mechanical mixture. The emulsification under this process, is fixed, i. e. the product unlike the ordinary emulsions, does not resolve into component parts, and, strange and confounding, the quality—the degree of lubrication is enormously increased.

What is the resultant product?

Chemical authorities who have examined it are confounded. They say that they know the elements that went into it, of course, but now, each of the elements that we knew, have suddenly lost their identity completely, although the individual value of each element is there. The finished product is enormously increased in value by this strange process.

And, strangest of all-it cannot be analyzed. We have a new chemical element that, by tests prove a superlubricant auxiliary.

MERCUROIL added to the crankcase acts to coat surfaces with a film of absorbed Mercury and Graphite. Oil "wets" surfaces treated with Mercury much more freely than it "wets" plain metal. This improved "wet-ting" contributes to the reduction af oil film rupture, making the oil stay on the friction surface for a quick, easy start, and absolutely without damage in the coldest weather.

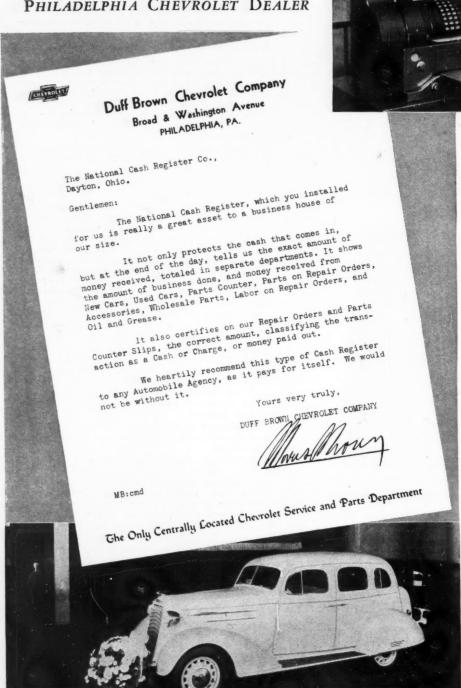
Yes, we are discovering a new world—of business. We are priveleged to like it—or dislike it—but it is here. Individual success, now, is going to depend upon speedy syncronization with the new tempo as set up by modern business.

NATIONAL AUTO PRODUCTS CO.

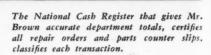
SECOND AND MARKET STS. LA CROSSE, WISCONSIN

Protects the cash that comes in...tells us the exact amount of money received"

...WRITES MR. BROWN OF THE DUFF BROWN CHEVROLET CO., WELL-KNOWN PHILADELPHIA CHEVROLET DEALER



Corner of salesroom, Duff Brown Chevrolet Company, Philadelphia, Pa.



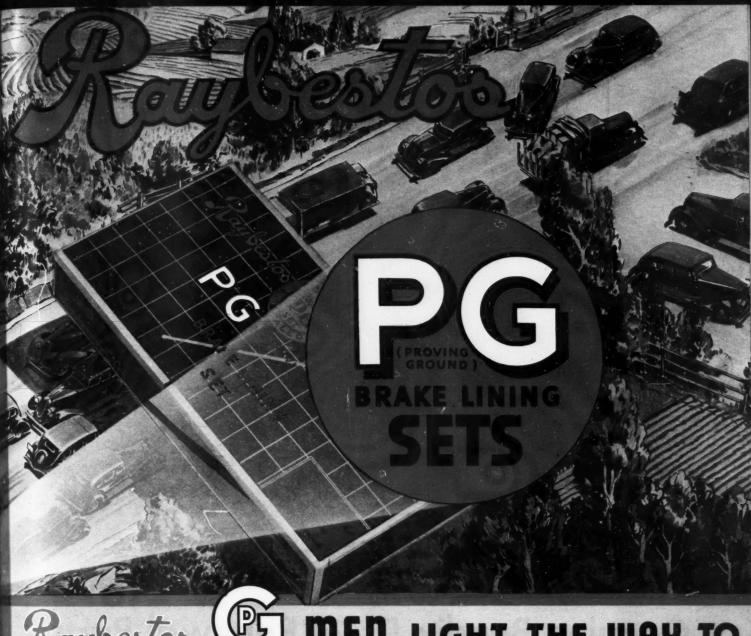
Mr. Brown's letter, reproduced here, tells briefly about a few of the benefits a modern National Cash Register offers to automobile dealers.

Aside from providing an accurate record of all cash sales, charge sales and money paid out, Mr. Brown's National also segregates sales by departments. Repair orders and parts counter slips are certified with printed figures which enforce a correct record of each transaction.

A National System similar to Mr. Brown's can be a valuable aid in the more profitable operation of *your* business. Our local representative will be glad to supply complete details. Or write direct to us.

Mational Cash Register Co.

Cash Registers • Typewriting-Bookkeeping Machines • Posting Machines • Analysis Machines • Bank-Bookkeeping Machines • Check-Writing and Signing Machines • Postage Meter Machines • Correct Posture Chairs



Raybeston MEN LIGHT THE WAY TO LARGER SALES and BIGGER PROFITS for 1936

PG'S EASIER TO SELL THAN EVER BEFORE.

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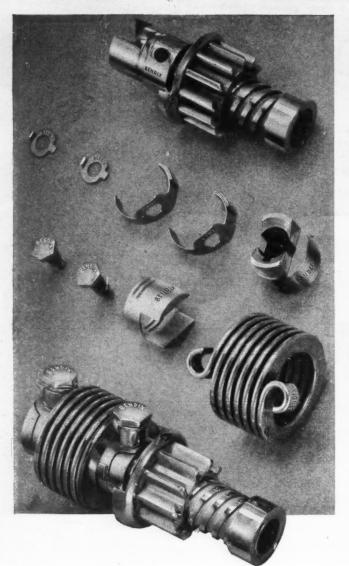
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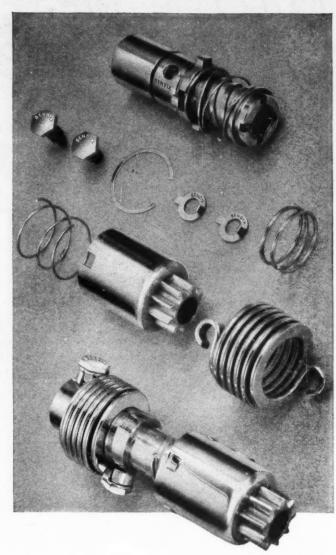
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- AN AGGRESSIVE HEAVY DUTY PROGRAM.
- NEW DISPLAY CABINETS, ATTRACTIVE FRANCHISE DEALS.
- 6 1936 BRAKE CLINIC PRESENTATION; NEW TALKING PICTURE.
- 3 PG COOPERATIVE CAR DEALER CAMPAIGN.
- 7 SPECIAL CAMPAIGN FOR INDUS-TRIAL FIELD.
- POWERFUL MERCHANDISING AND SALES PROMOTIONAL DRIVE.
- 8 NEW BRAKE SERVICE EQUIPMENT, "SIZE MARK" RIVETS.

HE RAYBESTOS DIVISION OF RAYBESTOS MANHATTAN BRIDGEPORT, CONN.





Genuine Bendix Drive Renewal Parts Now Carry the Quality-mark of Bendix Manufacture

PROTECTING the customer, the dealer and the jobber, the name "BENDIX" now appears stamped into genuine Bendix renewal parts. Only Bendix builds Bendix Drive. Only genuine Bendix renewal parts can be depended upon to restore its original effectiveness and reliability when through long use certain parts need replacements.

The Bendix Drive Exchange Plan is a moneysaving and an added protection to the car owner, and a powerful sales-persuader for dealer and jobber. Simplicity itself—here's how it operates: The dealer makes a standard liberal allowance to the customer for his old, worn Bendix Drive. The old drive, sent to us in the carton which contained the new drive, obtains you the credit at once. In other words, Bendix pays the exchange allowance.

ECLIPSE MACHINE COMPANY, Elmira, New York (Subsidiary of Bendix Aviation Corporation)

Only Bendix builds the

BENDIX DRIVE



R AGE

and

ates:



PREST-O-LITE BATTERY CO., INC.
Oakland, California INDIANAPOLIS, IND. Toronto, Canada

Prest-o-lite



an Engineered Program for 1936

YEAR-ROUND PROFITS— Clutch jobs are at their peak in winter; brake jobs in summer. The combination of Rusco Engineered Brake Service and Rusco Engineered Clutch Service brings you steady profits every month of the year. Rusco is the most complete line of friction materials for both brakes and clutches that can be obtained from any one source. Products attractively packaged.

MADE TO BE RIGHT—NOT TO BE CHEAP

America's "cheap" spree is over. Today the public wants quality. Rusco Products are neither made cheap nor sold cheap. They are based on years of experience in developing friction materials for leading car manufacturers, plus

extensive laboratory and road tests. They are manufactured for service men who want to do quality jobs and have the guts to sell them.

A MERCHANDISING PLAN THAT MAKES CUSTOMERS SAY "YES"—The toughest part of selling brake service is to keep customers from going to the "cut-raters." Rusco Engineered Brake Service is the first plan ever developed to lick this problem. It brings you more re-line jobs—and every one at a full profit. If you would like to know how it works, clip the coupon for a free copy of "At the Cross Roads."

THE RUSSELL MANUFACTURING COMPANY, Middletown, Conn. In Canada, St. Johns, P. Q.

The Russell Manufacturing Company Middletown, Conn. (In Canada, St. Johns, P. Q.)

Please send free copy of your 24-page book "At the Cross Roads."

Name	
Street	
CityState	
Check whether service stationor distributor(Dep	t. AA1)

Repair Profits Or Losses which?

Much depends on the Flat Rate Book you use

All Flat Rate Books look impressive. All are large volumes running upward to a thousand pages.

But the test of a Flat Rate Manual is not its size, or weight, its physical appearance, its listing of all labor and material cost, its data on trouble shooting—

The real test is in the brains, knowledge, and practical experience that went into its preparation.

That is what you really buy. That is what you found your estimates on. That is what a Chilton salesman has to sell you.

We therefore say: Don't buy a Flat Rate Manual as such. Buy the experience and knowledge of the organization that put it together.

If you buy on that basis you will always buy a Chilton Flat Rate.

For Chilton is universally recognized as the leading publisher in the automotive field.

For forty years Chilton has grown with the industry,

has pioneered in scores of publishing achievements. The Chilton Flat Rate Manual is merely one of these. Chilton invented the Flat Rate Manual.

No other publisher has this continuous experience. No other has six periodicals in the automotive field as do we, that give us the largest and finest group of technical and practical authorities on maintenance. No other publisher has a special Flat Rate staff as large as ours. No other has the facilities to do the same kind of painstaking and exhaustive job that has characterized the preparation of Chilton Flat Rates through ten editions.

When buying your next Flat Rate, therefore, buy the Company behind the Book. That way you'll be safe.

The way to do this is to be sure the name CHILTON is on the cover of the Flat Rate you buy.

The Chilton 10th Edition is now on press. It will be out positively on January 1st. Wait for the Chilton representative or send in your check for \$6.00 now to insure a first delivery. Simply attach your check or money order to the form below.

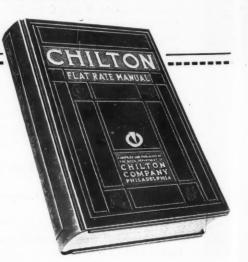


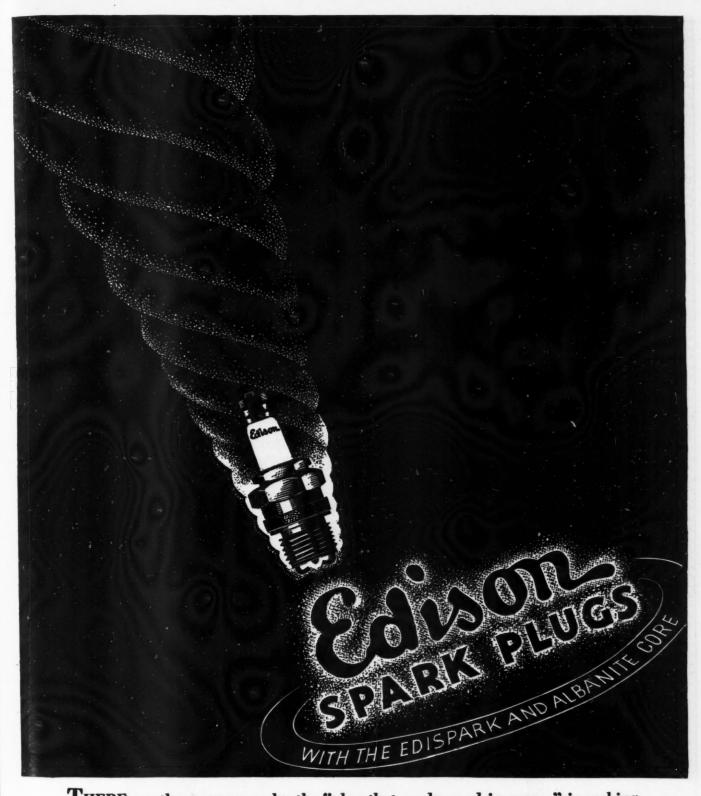
Tear off and Mail

Chilton Book Department
Chestnut & 56th Sts., Philadelphia, Pa.

Attached find check, money order, cash for \$6.00. Send me one of the first copies of the Chilton 10th Edition Flat Rate Manual.

Name
Concern
Address





THERE are three reasons why the "plug that made good in a year" is making increased sales for Edison distributors and dealers. First—the name! Second—the Edispark! Third—the Albanite Core! Any one of the three is in itself a definite selling advantage—all three offer an unrivalled profit-producing combination.

EDISON-SPLITDORF CORPORATION, WEST ORANGE, N. J.



GE



An organization of specialists, trained in the manufacture and development of high quality automotive gears.

Thirty-Eight Years of PERFORMANCE and SERVICE with a QUALITY Product.

The oldest and largest manufacturers of Differential Gears and Pinions for the motor car industry.

Acceptance by the better Replacement Parts Wholesalers and by Service Men throughout the land, confirms the statement that - back of the Trademark is the Better New Process Gear Service. Replacement

NEW PROCESS Products are all neatly packaged in convenient "locked-end" tamper-proof packages.

To insure against improper application and installation, NEW PROCESS now number of Rivets properly heat treated and of correct length and diameter with each Packaged Differential Gear Set. To further insure against error, an illustrated Installation and Adjustment Sheet with complete instructions is furnished with each Packaged Gear Set.



SIECKEL AUTO SUPPLY CO. DENVER. COL SIECKEL AUTO SUPPLY CO. WICHITA FALLS. WACG SPAIN BROS. AUTO SUPPLY CO. CHICAGO. ILL. COGDELL AI. SPAIN BROS. AUTO PARTS CO. CHICAGO. ILL. COGDELL AI. SPAIN BAUTO PARTS CO. CHICAGO. ILL. SANTA BARBANTO. SHARLIES AUTO PARTS CO. LAKELAND FARTS CO. SHARLIES AMC GREGOR AUTO PARTS CO. LAKELAND FARTS CO. SHARLIES AMC GREGOR AUTO PARTS CO. LAKELAND FARTS CO. OR SPECIALTIES CORP. The Better Replacement Gear Service.

FORT SMITH. A

MONTICELLO. N.

NEW PROCESS GEAR CORP., SYRACUSE, N. Y.

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MELPINSTILL SALES CO. HORNELL. N.Y.

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HUMPREYS SPRING CO. MOINES OWA REPL

AUTO FARTS CO. DES MOINES HOUSTON.

AUTO FARTS CO. SUPPLIES. ATI ANTA GA.

JOE LUDWIG AUTO SUPPLIES. ATI ANTA GA.

TEX. MARLOW BROS. ATI ANTA GA.

AUTO PARTS CO. VES TIPLIES. HOUSTON.
JOE LUDWIG AUTO SUPPLIES. ATI ANTA N. Y.
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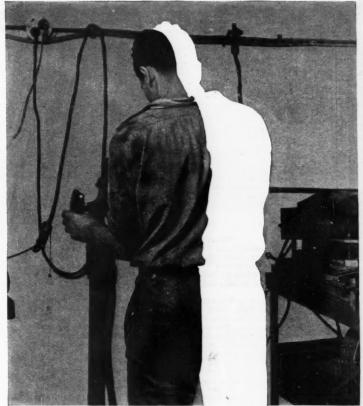
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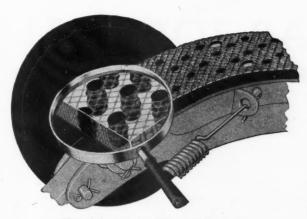
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NACOG 0. PARTS

Brake lining that does not dissipate heat, is like Half a man or



Half a man on a whole man's job



Phantom view of Allbestos King Pin. U. S. Pat. No. 1960881.

Brake lining must be more than just a piece of frictional material. That's only half its job. It must also help dissipate the heat generated in stopping vehicles at today's high speeds.

Allbestos King Pin is the only lining with PINS scientifically designed to dissipate heat and control friction. It is the lining which maintains uniform brake temperature — uniform adjustments — uniform performance—in the face of hills, high speeds and heat. It keeps brakes cool, smooth, SAFE!

Install Allbestos King Pin, and then a TestABrak. TestABrak enables the vehicle operator to check the condition of his brakes DAILY. Develops profitable adjustment business. Write for FREE sample length of Allbestos King Pin—no obligation. Write Allbestos Corporation, Philadelphia, Pa. Warehouse stocks—Atlanta, Boston, Chicago, Dallas, Kansas City, Los Angeles, New York City, Seattle.

Allbestos

KING PIN BRAKE LINING Stop Quick-Live Longer

"Creating a more favorable



THE K-D LAMP COMPANY

AUTOMOBILE LAMPS CINCINNATI, OHIO

Commercial Car Journal. Chestnut and 56th Streets, Philadelphia, Pa.

Gentlemen:

Undoubtedly you will be interested to know that our advertising in your publication has been most satisfactory, both from the standpoint of creating a more favorable acceptance of our complete line of reflectors, torches, headlamps, tail lamps, truck mirrors, and so forth through the jobber, and on an actual inquiry basis as well.

The initial page advertisement which ran in the March, 1934, issue produced between seventy five and sighty inquiries from the larger and more important fleets of the country. The quarter page advertisements which we have been running each month since are bringing inquiries from this same source as well as from jobbers at the rate of from fifty to sixty per month.

We are very glad to endorse "Commercial Car Journal" as an advertising medium to any mammfacturer who has a story to tell to the large fleet merket and who wishes to impress the jobber with a program to help build sales in this heavy duty field.

THE K D LAMP COMPANY

acceptance of our complete line."

Says

Mr. H. R. Kearns. President of The K-D Lamp Co.

his advertising

COMMERCIAL CAR JOURNAL

The experience of K-D Lamp Company is typical. Many other letters express similar satisfaction with advertising results obtained through this leading Truck Fleet publication.

With an increase of 90% in advertising volume during 1935—and 8,183 traceable inquiries to this advertising in 9 months, the lights are Green both for COMMER-CIAL CAR JOURNAL and its many advertisers.

COMMERCIAL CAR JOURNAL

A Chilton @ Publication

Chestnut and 56th Sts., Philadelphia, Pa.



THE K-D LAMP COMPANY PLANT



TUNG-SOL chose the Automobile Show week to announce to millions of consumers the most recent developments in TUNG-SOL Auto Lamps.

The above message in Time Magazine, reaching many car owners of the best class in your locality, features WINX...the new stop light bulb that blinks and Vis-Aid...a new and better headlight bulb.

Now is the time to capitalize on this extra advertising. Say "Turn on your lights, please" every time a car drives in. Then show the driver Vis-Aid and WINX. Both the desire to be safe and be different are satisfied by these new lamps.

TUNG-SOL has a definite program to help the dealer sell more auto lamps. Get the details from your TUNG-SOL jobber or write to our nearest sales office.

See Winx and Vis-Aid demonstrated. Booths 1028-30, A. S. I. Show. Headquarters, Ritz-Carlton Hotel

TUNG-SOL LAMP WORKS, INC.

SALES OFFICES: Atlanta • Boston • Charlotte • Cleveland Chicago • Dallas • Detroit • Kansas City • Los Angeles • New York Philadelphia • Rochester • GENERAL OFFICE: NEWARK, N. J.



HEATING SYSTEMS PROVIDE

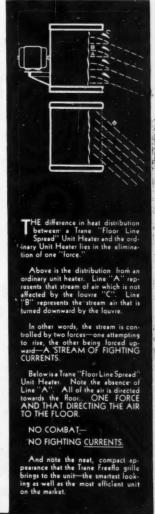
You want your heating system to spread heat down in the living zone. That is where people live and where conditions must be pleasant for them to work efficiently. TRANE "Floor Line Spread" Unit Heaters put the heat in the living zone and spread it so effectively that your fuel

bills will be cut as much as 25% on many installations.

Send for the list of TRANE Unit Heating installations in garages. It will interest you to see how this outstanding Unit Heater with the exclusive feature of "Floor Line Spread" is cutting fuel costs and improving working conditions in the motor industry.

There are hundreds of styles and types of TRANE Unit Heaters to meet every requirement of your garage, factory, warehouse or office heating installation. A competent TRANE Engineer will be glad to make recommendations to you.





THE TRANE COMPANY Dept. A12

Please send complete data on TRANE Unit Heating Systems.

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AGE



"SURE LIVES UP TO ITS NAME"

"I've been in the garage business a long time but I've never seen a Reliable Jack fall down on the job. It's named Reliable and that's exactly what it is."

Reliable Jacks are built for the hardest kind of service. For more than 30 years they have represented a standard of quality that has made them the leaders in the jack field everywhere. There's a Reliable for every job and the prices are right.



A MODERN JACK FOR MODERN CARS

Just right for the low slung modern cars. Squats to 3¾ inches to raise easily any front or rear end, when tires are flat. Speed pump raises saddle to load—then cuts out automatically. Raises to 22 inches. Safety device prevents overloading. Release lever at finger tips. Capacity, 2 tons.

HERE'S ONE FOR CURB AND ALL AROUND SERVICE

The compact handy jack for all around service. Easy to handle, sure in its performance. Short stroke. Sad-

dle speedily elevates to load without jacking. Nine inch raise—total extended height, 19½ inches. Capacity, 1 ton. Ask your jobber or write us for catalog of complete line of service station equipment.



RELIABLE

Builders of Dependable Jacks for 35 Years 1401 WEST SECOND STREET, DAYTON, OHIO

COMPA

Back Again And All NEW



Covers 85% of Maintenance Buying Power

The new MOTOR AGE is a practical business paper for the automotive maintenance field—reaching 85% of the buying power of this great market.

Now advertisers may concentrate their advertising in this field—directly, and with amazing economy.

MOTOR AGE

A Chilton D Publication

Chestnut and 56th Streets, Philadelphia, Pa.

JOHNSON SUPER OIL CONTROL

STON



Puts More Pep in Overhauls

To get more business, put more pep in ring jobs. You can do it with Johnson Super Oil Control Rings without reboring if the cylinders are less than .003 out of round. The job is done quicker, with less labor, longer profit, and the customer is better pleased.

The whole Johnson Line makes any rebore or ring job easy, peppy, and long-lasting. There's money—good money—more money in using Johnson's. Let us tell you how. Write now for catalog and price list, or call up your

JOHNSON PISTON RING COMPANY Headquarters for Show Marlborough-Blenheim Hotel

> JOHNSON PISTON RING CO. 6010 WOODWARD AVE. DETROIT, MICH.



The NEW "KING" Type MT-210 is an outstanding unit that immediately wins the admiration of all who see it. It is just as EFFICIENT as it is BEAUTIFUL. It is our contribution of a modernistic unit that is in keeping with the "curves" of today. It has many EXCLUSIVE "KING" Features and will locate trouble accurately and quickly. It will soon pay for itself because with it you can render the kind of service that brings repeat business.

"KING" METERS

One of the most important features of the "KING System" of Motor Tune-up are the exclusive "KING" Meters. They ELIMINATE all guesswork by showing DIRECT readings on the Meter. You get CORRECT answers in black and white like your watch tells the time. This enables you to explain to customers what is wrong and also prove that trouble has been corrected.

NO DOWN PAYMENT

We have authorization from the Federal Housing Administration to make Modernization Loans through our wholly owned subsidiary. The King Finance Corporation, on all "KING" Equipment. No down payment. No carrying charges. 12 to 36 months to pay.

See Our MT-80 at \$85.00

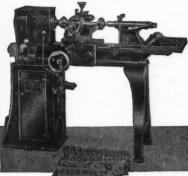


"KING" MT-210 \$245.00 Sold on **Deferred Payments**

Ask Your Jobber or Write Us Jobber's Name

CINE ELECTRIC HEAT CONTROL CO. DI23 INMAN AVE. CLEVELAND, OHIO KING Good Products Since 1914-KING

When "Slip-in" Bearings Fail ... You can lick the job by BITTING



Don't get discouraged and throw away those old kon-rods when slip-in bearings won't stay in place or stand up in service. Remember-these kon-rods can be babbitted and accurate bearings that will stand the gaff can be turned out with Hempy-Cooper Rebabbitting Appliances.

Model 50 Bearing Bor-ing Machine is a pro-duction model that will accurately finish bear-ings, standard or un-

(Model 50)

dersize, from $\frac{7}{6}$ "- $4\frac{1}{2}$ " in diameter, handling rods up to 24" in length, center to center.

Model H-60 Universal Jig holds dies for casting babbitt bearings into kon-rods, main or bronze backs.

To get details on this time saving, profit producing equipment, write for Catalog No. 14 covering complete line. Tell us your requirements and we will gladly make recommendations.

HEMPY-COOPER

Manufacturing Co.

Kansas City, Mo., U.S.A.



New, Improved ALUPAK CYLINDER HEAD GASKETS

We claim that ALUPAK, constructed of alternate layers of thin sheet aluminum, asbestos and wire mesh impregnated with a patented heat-proof compound, will do a better sealing job—on new surfaces or on warped, uneven surfaces. And instead of talking theory, we simply say: "Accept an ALUPAK Gasket with our compliments; install it on the toughest job that comes into your shop; and let ALUPAK speak for itself."

FELT PRODUCTS MFG. CO. 1528 Carroll Ave.

MAIL	THE	COUPON	FOR	YOUR	FREE	SAMPLE	TODAY
FELT Plea	PROI	DUCTS MFO	. CO.	1528 Carr Head Gaske	oll Ave.,	Chicago, Ill.	
		Model A Ford Chevrolet Plymouth Aluminum Hea		yea			
Name							
Addre							
City.					8	tate	

a.

GE

Puts the "Win" in Winter



You can't help but win with either one of these fast selling Winter items. Right now, when freezing weather brings all kinds of fuel troubles necessitating carburetor and fuel pump overhaul, is the time to put these little money makers to work.

HYGRADE FILTERETTE

A midget in size—a giant in performance. Installed on carburetor or fuel pump if filters the gas cleam. Prevents clogging of the carburetor jets. Insures proper functioning of the fuel pump. Especially valuable on 1934 fuel pumps, most of which have no glass bowl to show accumulated dirt. FP65—Fr all cars except Ford. List

FP65—For all cars except Ford. List 75c. FP65B — For Ford (including Adaptors). List 95c.

HYGRADE FILT-RITE

A standardized filter of simple construction for cars not filter-equipped; ideal for replacement. Quickly installed. FP50 List \$1.50

SERVICE STATIONS
If your jobber can't supply you
write us for full particulars, being sure to send us his name.

Liberal Jobber and Dealer Discounts.

HYGRADE PRODUCTS COMPANY

516 West 34th Street New York, N. Y.



PRODUCTS
arburetor & Fuel
ump Replacement
Parts

Carburetor Heat Riser Repair Kit

Shock Absorber Parts

Speedometer Tips and Shafting Etc., Etc.



STOP THOSE RATTLES AT 10c. EACH

Guaranteed to Stop Any Window or Hood Rattle!

A sure-fire seller. One or two of these little arrestors, selling at only a dime apiece, will stop any rattle immediately.

Installed in a Jiffy— Just slip it in with the tempered spring next to the window guide or hood fabric rests. Two prongs hold it in place permanently.

Easy Sale—Put up five arrestors on a card, ten cards in attractive display carton. They sell on sight. Every car has its pet rattles, and the owners want them stopped!

Good Profit—You sell them for a dime and make a worthwhile profit for yourself. Send the coupon now for a carton mentioning your jobber's name and address.

THIS

Universal Arrestor Company

310 E. Wisconsin Ave., Milwaukee, Wis.

Name

Company

Address

The best equipped shops make the quickest money

As modern repair work and servicing grow more complex and exacting, garages and shops depend more on

IMPERIAL

Service Tools



Order from your jobber; write also for catalogs to

IMPERIAL BRASS MFG. CO. 1217 West Harrison St., CHICAGO

20 Million Cars Out of Balance!

Get Into Wheel Balancing!

Catch up with the procession. Equip your stand the procession. Equip Stand the procession of the procession of

Adjustable Balancing Weights

L & H Wheel Balancing Weights have the
advantage of being removable for readjusting
when tires are changed—also to offset uneven
tread wear. Yet it is impossible for
tread wear. Yet it is impossible for them to
come loose when properly placed in position
on the rims—because they are held in pace by
a hardened, pointed set-screw.
a hardened, pointed set-screw.
to install of any prosive.
Absolutely non - correct
Has received full factory approval of
automobile and tire engineers. Carried
automobile and tire engineers.



44€



Write for Sales
Bulletin on
"Why Wheels
Should Be
Balanced"

Harley C. Loney Co. 16517 Wisconsin Detroit, Michigan

NEWLYPE

The Profit-Making Line featuring the following

5 EXCLUSIVE SALES LEADERS

- 1—Nokrode Battery Cable Units (they do not corrode)
- 2—Super Duty Ignition Cable Units (insulated with Okolite)
- 3—Oilproof Portable Cord (resists oil, grease, etc.)
- 4—Thiokrene Non-Braid Ignition Cable (not a sheath, but *all* insulation)
- 5—Cellophane Wrapped Friction Tape (sealedin goodness)

Dealers and repair shops all over the country are asking their jobbers about this profit-making line, because they realize it provides exclusive items that comprise 75% of their sales in this field. Why not write for the Newtype catalog and complete information of how you can cash in on the Newtype Deal?

THE OKONITE COMPANY NEWTYPE AUTOMOTIVE DIVISION

Passaic, New Jersey

Here's How

(Continued from page 29)

to make the complete inspection piecemeal, without confusion. It is ruled off into spaces for motor, clutch, transmission and the other operating units. There is ample space to write in our reports. For the motor unit the form provides twice as much blank space as for the clutch unit, because, as a rule, more work is needed on the motor. Similarly, we need more space for the ignition unit, and also for the section indicated as 'Miscellaneous, body, fenders, etc.'

"As a rule we suggest that the owner leave the car with us for a full day. Either my partner or myself arrange our time to inspect it properly as we find it convenient, allowing for interruptions and other unforeseen circumstances."

However, the owners of this shop never undertake an inspection without the express permission of the owner. On this point Mr. Benn makes the interesting observation:

"Car owners who use our lubrication service and come in for other light service are, of course, considered logical prospects for repair work, and we try to interest them in the periodical inspections. However, we first secure the owner's consent and arrange for him to leave the car for a few hours or a day so that the inspection may be handled properly.

"More recently we have conducted an educational campaign to reach car owners in general, hand-picking them from car owner lists furnished us by the regular sources. Periodically we send them copies of our special inspection form, on which we type a letter calling attention to our inspection service.

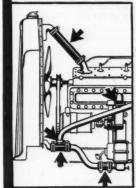
"These letters bring us many responses and result in some profitable service jobs.

"In the majority of cases car owners contract for repair jobs right after the inspections have been made. In other instances the reports are filed away in our shop office, and the owners are followed up often, usually every 60 days, until they decide to have the repair work done.

"There is only one thing I can add. No service shop today can exist unless the owners are prepared to render a high type of personal service. A systematic inspection service, intelligently handled, is the essence of service. That is why it has brought us excellent results."



TO MAKE JOINTS
LEAK-PROOF
WHEN INSTALLING
CAR HEATERS



HOSE

WATER PUMP

JOINTS

WATER PUMP HOSE

ALL CAR HEATER CONNECTIONS

All hose connections to radiator, water pump joints and heater connections must be made absolutely leak-proof at time of installing car heaters and adding anti-freeze solution to cooling systems. GASKET GOO seals tight but it won't over-cement! Joints made with GASKET GOO can be easily reopened when the time comes—as it always does.



MADE BY THE MAKERS OF THE FAMOUS PEP GRINDING COMPOUND

...IT GRINDS THE HARD STEEL SEATS

SEND COUPON NOW FOR FREE SAMPLE

ATTACH BUSINESS CARD OR BILL-HEAD TO THIS
COUPON FOR A BIG SAMPLE
PEP MFG. CO., INC.

	PEP	MFG	. CC)., IN	C.
33	W. 4	2nd	ST.,	NEW	YORK

GASKET	G00	PEP	GRIND	ING COMP	DUND
NAME		 	- 1		*
ADDRESS		 	work in a		MAI





Made of the finest materials ob-tainable. Expert, experienced Heat Treatment, Uniform Oil Temper, plus skilled workmanship and rigid inspection in our modern, up-todate plant.

A full line with immediate shipments for every Car, Truck, Bus or Trailer whether it is an "old timer" of 1924 or to replace 1936 equipment.

A Complete Line of Helper Springs

ASK YOUR JOBBER

for Genuine Service - Indianapolis Springs—make your next replace-ment a simple, profitable job for you—and more than satisfactory for your customer. And write us, today, for free catalog and interesting dis-

SERVICE SPRING CO. INDIANAPOLIS, IND.

THE MAGIC BOX OF PROFITS!



Every time a piston adjustment job comes into your shop, reach for this new Uni-Flex Drill Set. It's the Magic Box of profits! You must make a perfect piston skirt adjustment every time, because the holes cannot be wrongly placed. The Uni-Flex Expander-Adjuster precisely adjusts each piston to the worn cylinder. Consists of 1 doz. Uni-Flex Piston Skirt Adjusters, I drill Jig. 14% Drill. List price \$7.95 less 40% discount. Order your set today!

THE DALL MANUFACTURING CO., Inc. P. O. Station "D" Cleveland, O.





Price Stabilization Aids Tire Dealers

(Continued from Page 46)

made in three instalments starting next spring.

Service stations and repair shops which are equipped for tire retreading work benefit two ways as result of recent developments. First the price stabilization program has materially increased the "going price" to the consumer-and with every new tire price advance tire retreading work is substantially stimulated. Secondly, manufacturers have reduced prices on camel-back-the main retreading material. Prices on first line camel-back have been cut from 20 and 21 cents per pound to 18 cents, while a new second line camel-back has been introduced by some manufacturers at 161/2 cents per pound.

Service School Opened By K. C. Trades Assn.

Independent repairmen, service station owners and their employees are taking advantage of the cooperation offered by the Automotive Trades Assn. of Kansas City by attending the second annual A. T. A. Service School.

The sessions, which began Oct. 29, consist of eight weekly two-hour shop talks presented by experts from various manufacturing and service institutions. Demonstration equipment, charts and pictures are used to make subjects interesting and understand-

Seven subjects were listed in a recent outline of the course. They are: Heating and Cooling Systems, Bat-tery Service and Lubrication, Fuel Systems, Electrical System and Clutch, Selling Safety Service, Motor Reconditioning, and finally Appearance Service.

Ampco Voltage Regulator **Guards Against Overcharge**

The Ampco voltage control current regulator is designed to insure a fully charged battery at all times and at the same time to protect the battery against overcharging. It is intended primarily for use on cars equipped with radios, electrically operated heaters and other current consuming accessories. When the generator first starts charging, the regulator points are closed, but as soon as the battery becomes fully charged and the generator voltage reaches a pre-determined value, the points open, automatically inserting a resistance in the field circuit. The reduced field excitation results in a reduced charging rate which continues until the battery voltage again drops to a set low value. The regulator, which is a product of the American Motor Prod-ucts Corp., 160 Varick St., New York City, is made in two models for crosswise or lengthwise mounting on the generator. Either type sells for \$4.



BELDEN MANUFACTURING COMPANY 4641-A West Van Buren Street, Chicago, III.





No. 501-SINKO Concealed Wireless CIGAR LIGHTER REPLACEMENT ELEMENT Complete. Fits majority 1935 Factory Equipped Motor Cars including Ford. This item is brand new and very much in demand. Write for Catalog, etc.

SINKO TOOL & MFG. CO. 351-371 N. Crawford Ave., Chicago, III.

Wonder Weld

REPAIRS CRACKED VALVE PORTS, CYLINDER WALLS AND WATER JACKETS WITHOUT TEAR-DOWN

Garage men, repair shops, etc., you can now install valve port inserts and guarantee them although casting has a crack outside of seat.

See your jobber or ask us for particulars. Money back if not satisfied.

MILLER MFG. CO. 1100 Mt. Ephraim Ave., Camden, N. J.



NOW IN BIG DEMAND

New Type Universal Blade, fits all arms. Blade rolls in action, no bending of rubbers. 7-ply wiping features give 100% wiping, therefore, clear vision at all times.

HACKETT PRODUCTS CO., INC.
Providence, R. I.

Mfrs. of Wiper Arms, Dual Wiper Attachments, Inside Wipers, License Plate Frames, Cigar Lighters, Magnetic Trouble Lights, Shimmy Stops, Parking and Fender Guldes, etc.



1.-\$9.00

-\$3.95



Perfect, low-cost Ignition Tests!

1. Circuit Analyzer shows exact condition of condens-ers on or off car. Tests all units and circuits. Reliable and simple to use. With instructions!

nistructions!

2. Ignition Synchrometer. Timing light for new system. Fool-proof, shock-proof, compact. Instructions! Order from jobber or direct from

ADLER MFG. CO. North Chicago, Illinois

ADLER

* THERE'S MONEY IN BRAKE JOBS

EVANWOOD

SAFETY

BRAKE BALANCER .50° complete READY TO USE

NOTHING ELSE TO BUY FREE ADVERTISING BANNER * Slightly higher west of Mississippi

C. & C. SALES CORP. 1775 BROADWAY NEW YORK CITY Exclusive U. S. Sales Agents



Modern Alemite Lubrication Equipment . . Alemite Temprite Lubricants . . Alemite High-Speed Motor Oil . . and Alemite's sales-building Oil . . and Alemite's sales-building displays will help you make more money from modern motorists who make pride in today's motor cars. Write in for complete information.

ALEMITE

A Div. of Stewart-Warner Corp'n.
1862 Diversey Parkway, Chicago, Ill.

RICH SILCROME /ALVES

First VENTILATED STEEL OIL RING

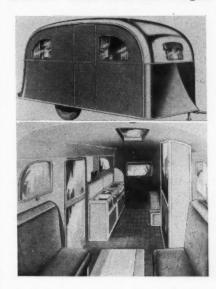


The first engineeringly sound answer to the trade's demand for a Steel Oil Ring. See your Hastings jobber or write Hast-ings Mfg. Co., 375 E. Mill St., Hastings, Mich.

Metro Road Cruiser Is Apartment On Wheels

That tourist trailers are keeping pace with automobiles in appearance and utility is evidenced by the Metro Road Cruiser exhibited at the New York show by the Metropolitan Body Company, Inc., of Bridgeport, Conn.

This modern streamlined apart-ment on wheels has been designed



to minimize loss of interior spaciousness. It combines the features of a kitchen, dining room, living room and bedroom by a simple arrangement of equipment, and is fitted with chromeplated lighting fixtures, full length closet with mirrored door, cabinets and drawers, curtains and screens at all windows and a radio aerial and outlet. Engineered throughout for lightness and strength, the chassis and body framing are of selected materials and reinforced with steel at points of stress.

Air Turbine Drives New Weber-Matic Seat Grinder

The Weber Tool Mfg. Co., 4140 Whiteside Ave., Los Angeles, Cal., has recently developed a valve seat grinder driven at 15,000 r.p.m. by an air turbine. It employs an eccentric method of grinding which is claimed to give great accuracy and fine finish. It can be used on the hardest seats and a positive feed is said to eliminate the danger of gouging.

New Jackomatic Introduced

The Jackomatic Corporation, 11 Broadway, New York City, is market-ing an outfit consisting of three hydraulic jacks, one fastened to the center of the front axle, and one on either side of the rear axle. A small electric motor driven from the car battery supplies hydraulic pressure for actuating the jacks, all control being from the driver's seat. When not in use the jacks fold up out of

MARVEL Mystery Inverse OILER

For Top Cylinder Lubrication



Model 0-G

Intake Manifold Installation Special for Ford V-8

RESERVOIR ONE QUART CAPACITY

Watchlike in construction, fundamentally and scientifically correct in operation, feeding oil only when oil is needed, eliminating excessive wear and keeping valves and pistons in an ideal condition. Whenever the intake vacuum increases or decreases, due to varying motor load and speed, the oiler will keep in perfect step—always delivering the quantity of lubricant required by the motor to eliminate sticky valves and prevent excess cylinder wear, feeding Marvel Mystery Oil into the intake manifold for top cylinder lubrication. Watchlike in construction, funda-mentally and scientifically correct

Both the O-G Model and T Model are quickly and easily installed under-the-hood.



Model "T"

Operates like the Model O-G. Easily installed under-the-hood, full two-quart capacity. Comes complete including fitting for any make of car or truck. Here is your opportunity to sell superior top cylinder lubrication! Marvel Mystery Oil is specifically made for this nurses.

Marvel Mystery Oil is especially recommended for any bearing metal or piston plating. Recommend its use which insures you a steady repeat business.

Order through your Jobber and Specify Name and Model of Car or Truck.

EMEROL MFG. CO., INC. 242 West 69th St., New York City

AGE



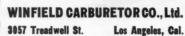




Stromberg Motoscope Corp. 2138 Lawrence Ave., Chicago



A new waterproof fluid, conveniently packaged and low priced. Repels water and provides instant starting for motors disabled from weignition systems, coils, distributors, etc. Prevents corrosion on battery connections. For facts write:



New High-Speed DREDNAUT BUMPERJACK \$285

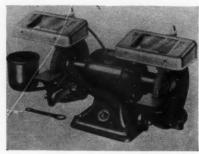
FASTER and EASIER to operate
— more positive action — thoroughly adaptable to all overhanging "fronts" and "rears" of new cars. Simply lift sliding rest to bumper bar and pump the handle.

AUTO SPECIALTIES MFG. COMPANY ST. JOSEPH, MICHIGAN



Delta Makes Bench Grinder With Twin-Lite Safety Shield

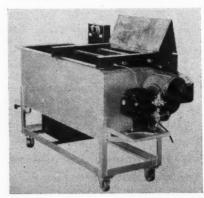
An interesting feature of the new Delta general purpose grinder is the "twin-lite" safety shield, which protects the operator's eyes from flying particles of abrasive, and at the same time incorporates a lighting system which illuminates both sides and face of the grinding wheel. These lamps are connected to the motor switch, so



that they are on only while the grinder is in actual use. This grinder, which is a product of the Delta Mfg. Co., 620 E. Vienna Ave., Milwaukee, Wis., is equipped with completely machined tool supports in order to insure accurate setting. The aloxite wheels are mounted directly on the motor shaft which is carried in double-seal ball bearings, which do not require any lubrication according to the makers. The Delta grinder is furnished in either the bench type or pedestal type.

Portable Unit For Oxide Coating of Aluminum Pistons

Alcote Incorporated, Detroit, Mich., has developed a portable alternating current unit for the oxide coating of aluminum alloy pistons in jobbers' shops. These units are supplied with transformers of either 110 volt or 220 volt primary current. The unit has a capacity of 16 pistons per hour.



One-half of the tank space is occupied by the rinse water while the remainder holds a lead-lined, steel-wire basket which contains the electrolyte, and allows cooling water to circulate on all four sides and bottom of the lead lining. A Sirocco exhaust fan removes all fumes, and self-contained air agitation is also provided.



Sectional Piston Rings Eliminate Reboring

Champion Multi-section Piston Rings give sensational performance. Results guaranteed or your money back. Write for circular and trial installation offer.

CHAMPION PISTON RING CO.
11629 LINWOOD DETROIT, MICH.

SAFE brake Jobs

When you get HOOSIER MOULDED LINING

from your jobber

You can guarantee a Hoosier Brake Lining job. This flexible moulded lining maintains uniform friction for its entire long life. It is easy to install. Supplied in rolls or matched sets by a jobber near you. Ask us for his address!

HOOSIER FRICTION PRODUCTS CORP.
NORTH MANCHESTER, INDIANA

ARVIN Heaters

FOR ALL CARS

Hot Water and Steam Models.
The largest selling line of car heaters.
Order now from your

NOBLITT-SPARKS INDUSTRIES, Inc.

Columbus, Ind. Makers of Arvin Radio for Car and Home



CORD

With its special appeal, and its lack of competition, the New Front Drive Cord offers an opportunity for substantial profits to Auburn dealers.

AUBURN AUTOMOBILE CO.
AUBURN, INDIANA

A New LOW PRICED Lathe ATLAS 9" at \$5475



Ideal for garage and repair shop. Automatic reversible power feeds—36° bed, 18° between centers. Gusranteed for .001° precision. Does all lathe jobs. Screw cutting gears \$4.00 extra. Price includes countershaft, belts and pulleys. Very easy terms, up to 3 years to pay. Send for new catalog just out.

ATLAS PRESS CO. 1845 N. Pitcher St., Kalamazoo, Mich.





PERMITE PRODUCTS

FOR ALL MAKES OF

CARS-TRUCKS-BUSES

A Standard Brand Line at Competitive Prices

ALUMINUM INDUSTRIES, Inc.

Wiry for says"HERE COMES SANTA!"



You'll think so, too, when you learn what profits you can make with

CRESCENT

Catalog FREE.

CRESCENT CABLE COMPANY

RIESS EQUIPMENT on FHA TIME PAYMENTS

12 to 36 months to pay. Write for details.

RIESS MFG. CO. Kokomo, Indiana, U. S. A.



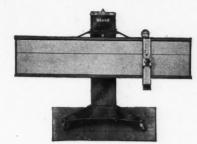
with these new and modern compressors, car washers, 8-Hour Chargers, Test Benches. Shops everywhere thank Hobart for bringing in new customers, making more money from old ones.

"No Cost to You" TERMS

Try Hobart before you buy—let it pay for itself with the extra profits it brings. Just mail this ad for details, no obligation. HOBART BROTHERS BOX TA-125 Troy, Ohio

New Headlight Tester Uses Photo-Electric Cell

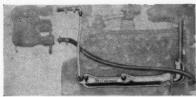
The Weaver Mfg. Co., Springfield, Ill., announces a new headlight tester which measures the intensity of the headlamp beam as well as the aim and focus. It is based on the use of a photo-electric cell from which the effect of daylight has been excluded. The rays from the headlight striking the cell generate an electric current in direct proportion to the brilliance of the rays, and this current is



metered on a visible gage which translates the current into terms of candlepower. The tester consists of a portable screen 6 ft. long and adjustable
in height. In front of the screen is
on optoscope, consisting of the photoelectric cell, gage and an internal
ground glass screen on which two
images of the headlight are projected.
By means of these images the screen
can be set at exactly 10 ft. from the
lights, and the gage on the face of the
optoscope will show the number of
inches drop of the beam in 25 ft.

Ray-Day Has Steam Heating System for Ford V-8's

"Instan-Heat" is the name of the new steam heating unit for Ford V-8's, being manufactured by the Ray-Day Piston Corp. of Detroit, Mich. It replaces the right sylinder block exhaust manifold and connects into the water supply line of any ordinary hot water heater. With this installation heat is



produced within a minute after starting, according to the maker. Among the features is a corrosion and heatresistant steel boiler located in the exhaust manifold. Although its area is large, the boiler holds a relatively small amount of water, and due to the regulator which controls the flow of water there is said to be no possibility of producing more than 12 ounces of pressure, nor of any steam entering the engine cooling system. The exhaust manifold containing the boiler is designed to provide a free flow of The gas, preventing back pressure. complete unit retails for \$7.85.



THE WINTER WINNER

SLEETEX, the guaranteed automatic Windshield Defroster Blade, is the hottest cold weather item you've ever handled.

You won't find any motorist who won't gladly pay 40¢ for the comfort, safety and peace of mind a SLEETEX Blade will give him.

SLEFTEX has a tremendous sales success record in 1934 to prove that the motorist welcomed the first really successful low-priced windshield defroster.

So, don't delay—be sure to get the facts about SLEETEX from your wholesaler, and cash in on the real profits that are waiting for you on this WINTER WINNER.

FITS ALL CARS— 4

40¢

The SLEETEX COMPANY, Inc. 404 FOURTH AVENUE, NEW YORK CITY

SLEETEX
WINDSHIELD
DEFROSTER BLADE



Now you can buy Allen Equipment—any type—on Government Finance Plan. No down payment—no carrying charge Easy installments spread over one to three years. Write for details.



ALLEN ELECTRIC & EQUIPMENT CO. MICHIGAN

FAST — HOT — EFFICIENT



A Professional Iron for Commercial Men. A quality iron built for efficient large surface soldering, Maximum heat, minimum cost. Unconditionally guaranteed

You can't go wrong—do the next job with an ESICO iron and watch your profits go up. Available at all Esico authorized Automotive distributors.

ELECTRIC SOLDERING IRON CO., Inc., 342 West 14th Street, New York City



DAYS TRIAL

. 320 KREGER IMPROVED BELL HOUSING SUPPORT

List Price



\$1.00

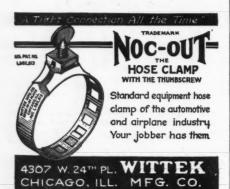
Your Cost 39c. U.S.A. Only

Buy dependable KREGER PRODUCTS from dependable jobbers — Save money — Beat competition and insure your customers of quality and lasting satisfaction.

The 50 other numbers in the Kreger Line will interest you—write for catalog and net prices.

The L. F. KREGER MFG. CO.

2260-70 Archer Ave.



Doehler Announces Filpruf Oil Dispensing Equipment

The Doehler Filpruf bottle tops, made by Doehler Die Casting Co., Toledo, Ohio, are designed to make it impossible to refill oil bottles, such as are used by service stations, except from authorized containers. aluminum top of the bottle is inserted into the drum nozzle for filling and cannot be operated in any other way.



Double Your Tire Grooving **PROFITS**



Only the New Champion gives you the exclusive, removable heating element—readily replaced by operator. Champion blades are adjustable for both depth and width. One hand control. Easy to operate. Heats quickly. Works ite for free folder.

fast. For bigger tire profits, write for free folder.

ALLIED MANUFACTURERS, INC. 408 River St., Ypsilanti, Mich.

Balanced Service Stocks



HYDRAULIC BRAKE PARTS

Nos. 616 & 717 Chrysler cars Nos. 818 & 919 General Motors cars Nos. 2020 & 2121 General Brake Service Priced as low as \$9.60 with free cabinet and jars. Write for copy No. 400A catalog and No. 410 Speedy Parts Finder to

CHAMPION ANTI-RATTLER CO., Inc.

1958 Washington Ave.,

The ALL WINTER Profit Line



Pat'd U. S. and Canada

FULTON Electric SLEET-FROST SHIELDS

The selling season for Fulton Electric Sleet-Frost Shields extends from the beginning of cold weather until mid-spring. Recognized as a necessity for safe driving, easy to sell and pay continuous profits. (Priced from 80c to \$6.00.)

THE FULTON COMPANY Milwaukee, Wis.

Classified

PATENTS—SMALL IDEAS MAY HAVE large commercial possibilities. Write immediately for information on how to proceed and "Record of Inventions" form. Delays are dangerous in patent matters. Clarence A. O'Brien and Hyman Berman, 68-W Adams Building, Washington, D. C.

PATENTS—TRADEMARKS. Instruction "How to Establish Your Right" and form "Evidence of Conception"—sent FREE. Lancaster, Allwine & Rommel, 415 Bowen Building, Washington, D. C.

MOTOR AGE

-is a publication keyed directly to the needs of the maintenance field. Built on the requirements of the serviceman. Edited by Bill Toboldt. Read it every month.

A Chilton Publication



Chestnut and 56th Sts., Philadelphia, Pa.



TESTER

Sells service work . . . assures extra profits . . . tests coils, condensers, etc. on car whetherengineisrunningor not. Battery operated . .

motor driven breaker . . . preheats coils . . . spark gap readings in millimeters . . . many other valuable features . . . Low Priced . . . WRITE FOR PARTICULARS.

230 W. SUPERIOR ST. CHICAGO, ILL

The complete line that completely satisfies



Fitzgerald Gaskets

THE FITZGERALD MANUFACTURING COMPANY TORRINGTON, CONN.

Ahlberg Ground Bearings

40% Saving Over New Bearing Costs

AHLBERG BEARING CO. Chicago

> Branches and Distributors Everywhere

> > Ahlberg Ground Bearings

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Cushion Grip Reduces Steering Wheel Vibration

The Steerwheel Cushion is shaped like a miniature tire and fits over the grip portion of the steering wheel, protecting the driver from vibration. It is made of "Fleshkin," described by the maker as a new odorless, aircushioned rubber product. It is said to give the driver a better grip on the wheel, while at the same time reducing the fatigue of driving. The new "X" line of cushion grips retails for \$1.95 each. A complete new wheel is supplied on an exchange basis for \$5.00. These new products are supplied by the Steerwheel Cushion Co., 18 E. Washington Street, Phoenix, Arizona.

Las-Stik Tube Vulcanizer

The Las-Stik electric tube vulcanizer operates on either D C or A C current and reaches a curing temperature in 2 min. A feature of this device is said to be the arrangement of the two heating elements. When the vulcanizer is first plugged in, the high heat element quickly brings the plate up to vulcanizing temperature, but at this point a thermostat automatically cuts out one element and the second or vulcanizing element maintains the proper temperature indefinitely, without danger of burning the tube. The vulcanizing plates are chrome plated to keep them rust-proof. This product of the Las-Stik Mfg. Co., Hamilton, Ohio, retails for

Davis First Aid Kit

The Davis first-aid kit, which is known as the "Brac-Kit," consists of two baked enamel steel cases, the outer one of which can be permanently attached to the wall while the inner one contains all the first-aid units, each holding enough material for several treatments. The inner case can be quickly unlocked in event of an accident and carried with all the supplies wherever needed. This outfit is a product of the Davis Emergency Equipment Co., 55 Van Dam St., New York City.

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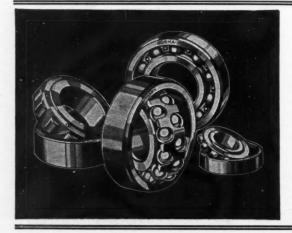
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